United States Court of Appeals

for the

District of Columbia Circuit

TRANSCRIPT OF RECORD

APPELLANT'S BRIEF AND JOINT APPENDIX.

IN THE

United States Court of Appeals

FOR THE DISTRICT OF COLUMBIA.

612

No. 8982. Civil.

United States Court of Appeals
for the District of Columbia
FILED JUN 22 1945
Joseph W. Stewart
CLERK

BENJAMIN WAITE BLANCHARD, JR.,
Appellant,

v.

Casper W. Ooms
~~CONWAY P. COE~~, Commissioner of Patents,
Appellee.

Appeal From the District Court of the United States for the District of Columbia.

J. PRESTON SWECKER,
National Press Building,
Washington 4, D. C.
Attorney for Appellant.

WILBUR W. WILLIAMSON,
Of Counsel.

INDEX TO BRIEF.

Page
Jurisdictional Statement 1
Statement of the Case............................ 2
Claims on Appeal 4
Statement of Points.............................. 7
Summary of Argument 8
Argument 9

INDEX OF DECISIONS.

Page
Carbide & Carbon Chemical Corp. v. Coe, 69 App. D. C. 372; 102 F. (2d) 236.................... 14
Electrons Inc. v. Coe, Comm'r of Patents, 69 App. D. C. 181; 99 F. (2d) 414; 38 USPQ 370.......... 11
Hildreth v. Mastoras, 257 U. S. 27, 34............... 18
In re Holmes (C. C. P. A.), 63 F. (2d) 242, 243....... 19
Lamb Knit Goods Co. v. Lamb Glove & Mitten Co. (C. C. A. 6), 120 Fed. 267, 272................. 18
Leeds & Catlin v. Victor Talk. Mach. Co., 213 U. S. 301 11
Miehle v. Whitlock (C. C. A. 2), 223 F. 647, 649...... 19
Seymour v. Osborne, 78 U. S. 516, 548-549........... 18
Walker on Patents, (Deller's Ed.) Vol. 1, p. 311...... 18
Webster Loom Co. v. Higgins et al., 105 U. S. 580.... 20

INDEX TO JOINT APPENDIX.

Page

Bill of Complaint as Amended........................ 1
Answer to Complaint as Amended.................. 7
Findings of Fact and Conclusions of Law........... 8
Judgment 10
Notice of Appeal.................................. 10
Transcript of Proceedings in District Court.......... 11
    Testimony of Benjamin Waite Blanchard, Jr..... 11
        Direct Examination 11
        Cross-Examination........................ 26
        Re-Direct Examination 28
        Re-Cross Examination 30
    Testimony of John H. Ebbert.................. 31
        Direct Examination 31
        Cross-Examination........................ 35
Specification, Claims and Drawings (From Pl. Ex. 1). 37
Affidavit of Benjamin Waite Blanchard, Jr.......... 44
Affidavit of B. G. Walton.......................... 46
Affidavit of Josephine Poe Duer................... 47
Affidavit of Isabel M. McKee 48
Affidavit of Nicholas I. Hogoly.................... 49
Affidavit of Ralph K. Bush 50
Affidavit of M. E. Baker........................... 51
Affidavit of Nicholas H. Warrick................... 52
Affidavit of S. F. Houston 53
Affidavit of Edward Y. Townsend.................. 54
Affidavit of Mildred Boericke...................... 55
Affidavit of Roger W. Barrington 56
Affidavit of Stewart A. Wolcott, et al.............. 59
Examiner's Statement 64
Decision of Board of Appeals...................... 72
Arias Patent, No. 1,820,643......................... 75
Speaker Patent, No. 1,828,910...................... 76
Jones Patent, No. 1,840,780......................... 77
Bodoh Patent, No. 1,850,914........................ 78
Clark Patent, No. 1,879,978......................... 79
Graves Patent, No. 2,039,988....................... 80

IN THE

United States Court of Appeals

FOR THE DISTRICT OF COLUMBIA.

CASE NO. 8982.

BENJAMIN WAITE BLANCHARD, JR.,
Appellant,
v.
CONWAY P. COE, COMMISSIONER OF PATENTS,
Appellee.

BRIEF FOR APPELLANT.

Jurisdictional Statement.

This is an action (Appellant's App. 1) filed by the appellant under R. S. 4915 (U. S. Code, Title 35, Sec. 63), against the appellee for a judgment that the appellant is entitled to have issued to him a patent containing claims 2 to 7, inclusive, of his application for patent on a Radio Antenna, Serial No. 266,453, filed in the United States Patent Office, April 7, 1939.

The defendant filed an answer (Appellant's App. 7) denying the right of appellant to a patent therefor, and after trial in open court, the District Court adjudged the appellant not entitled to a patent therefor, dismissing the complaint in a judgment dated October 31, 1944 (Appellant's App. 10), and also issued Findings of Fact and Conclusions of Law (Appellant's App. 8).

The appeal to this court is from that judgment of the District Court in accordance with Rule 10, of this court.

Statement of the Case.

Appellant filed his application (Appellant's App. 37) on April 7, 1939, and duly prosecuted the same in the United States Patent Office, but the Primary Examiner of the Patent Office refused to allow any claim for patent on this invention. After final rejection by the Primary Examiner, an appeal was taken to the Board of Appeals in the Patent Office who affirmed the Examiner's rejection of the claims. Thereafter this complaint was filed in the District Court, but the court dismissed the complaint holding that appellant "is not entitled to a patent containing any of the claims set forth in the complaint". Thus appellant is deprived of protection by a patent on his invention, all of his claims being refused.

As shown in his drawings (Appellant's App. 37), the subject-matter of this invention is a radio antenna adapted to receive radio waves and to transmit them to a radio receiving set. This radio antenna is designed to replace the overhead wire customarily used heretofore which must be strung out at great length at a high place, such as the top of a building, and connected through a lead-in wire directed down along the building to the radio receiving set which would be located at some convenient place, such as in the living room of an average house, or in one apartment of a large building.

The patent application sets forth that the radio antenna which constitutes the subject-matter of this application avoids numerous objections long encountered in radio antennæ as used heretofore, as well as to enable it to be constructed of compact portable character and yet will have improved wave reception, even though placed in a cabinet of a radio receiving set or at another point adjacent thereto.

Thus it eliminates the necessity for the location of the antenna at a high point on top of a building and strung out at great length, as has been thought necessary heretofore. Nevertheless, it has great sensitivity, enabling the reception of foreign broadcasts readily and clearly with a wide range of all-wave reception, and is non-directional so that it need not be turned in a particular relation to the source of the radio waves as was necessary heretofore for loop antenna.

In the example of applicant's invention, as illustrated in the drawings, this antenna comprises a plurality of flat windings of wire arranged one within another. The wires are wound on the frame-work shown in Fig. 1, inner windings 2*a* being wound on the supports designated 2, in side-by-side relation, with one end of each winding 2*a* connected with a cross bar 6 of metal. Intermediate windings 3*a* extend therearound, spaced therefrom, being wound on the cross bars 3 on opposite sides, lengthwise, of the windings 2*a*, and one end of each winding 3*a* is connected with a cross bar 11. A third set of windings 4*a* extends about the larger cross bars 4 and are connected at one end with the cross bar 7.

These pairs of windings are independent of each other, in spaced relation, and are connected at their lead ends to cross bars through which a lead-in wire 5 extends longitudinally through the frame-work, as shown in Figs. 1 and 3, for connecting the respective windings with the radio receiving set. The opposite end of each winding is open and disconnected.

On opposite sides of the windings, but not extending over the ends thereof or the lateral edges, is an insulated screen or filter 14, including a metal screen that is connected with one of the cross rods 8 or 12, which in turn has the lead-in wire 5 threaded therethrough for connection with the receiving set. The specification states that this screen or filter need not be in this particular form, but can be varied in its construction if desired. Moreover, the screen or filter does not extend entirely around the windings, even in the example shown in the drawings, since the windings are exposed at the ends of the antenna, as well as at opposite edges where the wooden strips 1 form no obstruction for radio waves. Thereafore, radio waves can reach the antenna elements from all directions—toward either side or the ends or lateral edges, whereby uniform reception is obtained of a non-directional character. Thus the antenna does not need to be located in any particular relation to the direction from which the radio waves are received thereby, in order to obtain clear reception throughout the entire wave band.

The merits of this invention are attested not only by the affidavits in the record (hereinafter referred to more in detail) but also by the demonstration made by appellant in the District Court as described in the record (Appellant's App. 17). Thus appellant was able to obtain reception with an ordinary receiving set, in the daytime, when foreign reception is most difficult, not only of local and domestic radio stations, but also of many foreign countries, as the record shows.

Claims on Appeal.

2. A radio antenna, comprising a plurality of flattened wire windings of different longitudinal and transverse measurements, nested together with their sides in relatively close parallel relation to one another, a metallic conductor extending through the smallest winding and to which one end of said smallest winding is connected, the other end of said winding being open, second and third metallic conductors outside of the opposite ends of said windings extending substantially parallel with said first conductor, one end of the outside winding and one end of an intermediate winding being connected to said last-mentioned conductors respectively, the opposite ends of said outside and intermediate windings being open, and a longitudinally extending conductor connecting said first, second and third conductors and providing an antenna lead for connection to a radio receiving device.

3. A radio antenna, comprising a plurality of flattened wire windings of different longitudinal and transverse

measurements, nested together with their sides in relatively close parallel relation to one another, a metallic conductor extending through the smallest winding and to which one end of said smallest winding is connected, the other end of said winding being open, second and third metallic conductors outside of the opposite ends of said windings extending substantially parallel with said first conductor, one end of the outside winding and one end of an intermediate winding being connected to said last-mentioned conductors respectively, the opposite ends of said outside and intermediate windings being open, a longitudinally extending conductor connecting first, second and third conductors and providing an antenna lead for connection to a radio receiving set, and wire mesh screens upon the opposite flattened sides of and parallel with the common plane of said windings, the opposite ends of each screen being also connected to said longitudinally extending conductor by leads of different lengths.

4. A radio antenna, comprising duplicate sets of a plurality of flattened windings of different longitudinal and transverse measurements, nested together with their sides in relatively close parallel relation with one another, a metallic conductor extending through the smallest winding of each set and to which one end of each of the smallest windings is connected, the other end of each smallest winding being open, second and third metallic conductors outside of the opposite ends of said winding sets extending parallel with said first conductor, one end of the outside winding and one end of an intermediate winding of each set being connected to said last-mentioned conductors respectively, the opposite ends of the outside and intermediate windings of each set being open, and a longitudinally extending conductor connecting said first, second and third conductors and providing an antenna lead for connection to a radio receiving set.

5. A radio antenna, comprising duplicate sets of a plurality of flattened windings of different longitudinal and

transverse measurements, nested together with their sides in relatively close parallel relation with one another, a metallic conductor extending through the smallest winding of each set and to which one end of each of the smallest windings is connected, the other end of each smallest winding being open, pairs of metallic conductors at the ends of said winding sets extending parallel with said first conductor, one end of each of the outside windings of each set being connected to one of the conductors of each end pair, and one end of each of the intermediate windings of each set being connected to one of the conductors of the other end pair, the opposite ends of said outside and intermediate windings being open, and wire mesh screens upon the opposite flattened sides of and parallel with said windings, one end of each of said screens being connected to one conductor of one end pair and its other end being connected to the opposite conductor of each end pair to provide connecting leads of different lengths, and a conductor extending longitudinally of and between said winding sets to connect said first conductor and said pairs of end conductors together, and provide a lead for connection to a radio receiving device.

6. A radio antenna, comprising a plurality of flattened windings, one within another and having their sides in relatively close parallel relation, a pair of wire mesh screens upon the opposite sides of said windings, one end of each winding being open and the other ends of said windings being connected with spaced portions of said screens to a conductor forming a lead for connection to a radio receiving device.

7. A radio antenna, comprising a plurality of flattened windings, one within another and having their sides in relatively close parallel relation, said windings being of substantially the same lateral extent and comprising substantially the same number of turns, a pair of wire mesh screens upon the opposite sides of said windings, one end

of each winding being open and the other ends of said windings being connected with spaced portions of said screens to a conductor forming a lead for connection to a radio receiving device.

It will be noted that claims 2 and 4 are directed to the new combination of a plurality of flattened windings of different longitudinal and transverse measurements nested together and extending over the cross rods for support and for connection with the longitudinal lead-in conductor that is recited as extending through the smallest winding, the conductor being shown as the lead-in wire 5 in the drawings Applicant's App. 37).

Claims 3 and 5 are directed to the same general combination of windings recited in claims 2 and 4, respectively, but with the addition of the wire mesh screens, as illustrated at 14-15 in the drawings, which screens are disposed at the sides only of the windings so far as the claims recite. It is not specified that the screens extend over the entire area of the windings, and, of course, they do not extend over the ends or the edges thereof.

Claims 6 and 7 are somewhat broader in scope, so far as the definition of the windings is concerned, but recite a plurality of windings associated with the pair of wire mesh screens and connected with a lead-in conductor which is connected also with the windings.

These claims define the new combinations on which appellant has asked patent protection, but such protection has been refused by the Commissioner of Patents. Nevertheless, it has been conceded that appellant's structure is new both by the Examiner in the Patent Office (Appellant's App. 68), and by the Board of Appeals (Appellant's App. 74).

The District Court did not find that the subject-matter of the claims was old nor anticipated by the prior patents.

Statement of Points.

(1) The District Court was in error in holding that the particular arrangement of windings and screens claimed

by appellant involves nothing more than the ordinary skill of a mechanic over the arrangement of windings for radio antennae as disclosed in the prior patents.

(2) The District Court was in error in holding that the various prior patents showed generally similar arrangements of windings in a radio antenna.

(3) The District Court was in error in holding that appellant has not shown that his radio antenna, as set forth in the claims here involved, produces any new or unexpected result or is superior to the prior art radio antennae.

(4) The District Court was in error in holding that none of the claims here involved defines invention in view of the prior art, and, therefore, that all of the claims are unpatentable.

Summary of Argument.

No one of the patents referred to by the District Court shows the construction claimed, multiple windings connected in a distinctive new combination with a lead-in conductor connected with one end only of each, the other end being open. Each of the patents to Speaker, Jones, Clark, and Graves, shows a single coil. Bodoh has three coils but connected in series as one. Arias has no coils, only a screen frame.

Both the Board of Appeals and the Examiner in the Patent Office admitted that the claimed construction is new, and was not anticipated thereby.

The construction claimed was not obvious from the prior patents. The prior patents were not designed for accomplishing appellant's results and would not do so.

The arrangement set forth in the claims possesses patentable utility as demonstrated by the appellant and sustained by the supporting testimony and affidavits.

The claims define patentable invention, and, therefore, are patentable.

Argument.

No one of the patents referred to by the District Court shows the construction claimed.

It has been pointed out above that all of the claims involved herein recite a plurality of flattened windings, one within another, with their sides in close parallel relation. Claims 2 to 5 define these windings in their relation to each other and their connection with a longitudinally extending conductor providing an antenna lead connected with the respective windings. Claims 6 and 7 recite the flattened windings in combination with a pair of wire mesh screens on opposite sides thereof and connecting the windings to a lead-in conductor. The lead-in conductor in each of the claims is exemplified in the drawings by the longitudinal bar 5, passing through the cross rods and the windings.

The Findings of Fact of the District Court (Appellant's App. 8) refer generally to the respective patents as showing merely windings of wire or a screen. If the claims recited no more than that, they might be said to read on such prior patents, but the claims define appellant's distinctive new structure, as is evident from their terms.

The patent to Arias, No. 1,820,643 (Appellant's App. 75), shows an aerial formed by screen wire constructed in box-shape closed by the end members 4. There are no windings of any kind, and, therefore, no flattened windings one within another, as defined in all of the claims, nor are there any wire mesh screens on opposite sides of windings, as recited in claims 3, 5, 6 and 7.

Speaker, No. 1,828,810 (Appellant's App. 76), is cited merely for a winding of insulated wire around a cylinder. It does not have flattened windings of any kind nor are there any windings of different sizes, one within another and connected with a lead-in conductor which extends through the intermediate windings and are connected with the respective windings or with the screens as recited in the several claims.

Jones, No. 1,840,780 (Appellant's App. 77), shows a continuous winding of multiple convolutions on a frame for the purpose of getting great length within a limited space. It has only one coil and is similar in that respect to Speaker, No. 1,828,810, although the coil is differently formed. The form shown in Fig. 5 of Jones is not an antenna but an electrostatic shield intended to surround the antenna and to be spaced therefrom (see Page 4 of patent, lines 1-8). Thus Jones, likewise, fails to show a plurality of windings separate from each other and respectively connected with a metallic lead-in conductor, as defined in the claims.

Bodoh, No. 1,850,914 (Appellant's App. 78), has three coils designated respectively at 2, 3 and 4 in Fig. 4, but they are arranged in side-by-side relation; are not flattened and do not have different longitudinal and transverse measurements; are not nested together with their sides in relatively close parallel relation; and are connected in series instead of in parallel as defined in the claims; and, of course, they are not individually connected with a lead-in conductor that extends through the smallest winding. With respect to claims 3, 5, 6 and 7, even though these coils are supported between metal cylinders 14 and 15, these cylinders are not the equivalents of the wire mesh screens defined in the claims, because they are provided for a different purpose, to shield the coils, whereas the screens provide antenna surface.

The patent to Clark, No. 1,879,978 (Appellant's App. 79), is the only reference that has a plurality of flat windings one within another, but these windings are not independent windings, but are connected in series with each other as shown also in Figs 1 and 6. Thus is formed in fact a single winding which has inner and outer portions. Appellant's antenna, as defined in the claims, involves a plurality of windings separately connected with a metallic conductor that extends through the smallest winding and is connected with one end only of each of the windings, the other ends of the windings being open or disconnected, as recited in all of the claims.

Graves, No. 2,039,988 (Appellant's App. 80), shows a single sinuous wire located between material sections 22 and 23, apparently of cloth. Obviously this does not involve any structure here claimed.

Thus it will be evident that no patent cited shows a plurality of independent separate flattened windings one within another with a lead-in conductor attached respectively to one end of each winding, the other end being open. No patent shows windings of any character, with wire mesh screens on opposite sides thereof.

Appellant has devised a new combination of multiple windings arranged one within another and each connected at one end with a lead-in conductor, the other end being open. Only this combination will accomplish appellant's results.

Therefore, it should be evident that appellant's structure, as defined in the claims here, is distinctly different from the disclosures in these patents, is a new combination and patentable as such.

Leeds & Catline v. Victor Talk. Mach. Co., 213 U. S. 301:

> "A combination is a union of elements, which may be partly old and partly new, or wholly old or wholly new, but whether new or old, the combination is a means—an invention—distinct from them. They, if new, may be inventions and the proper subject of patents, or they may be covered by claims in the same patent with the combination."

Electrons Inc. v. Coe, Comm'r of Patents, 69 App. D. C. 181; 99 F. (2d) 414; 38 USPQ 370:

> "The general principles applicable to the question whether invention exists in a combination of elements are briefly: The fact that all the elements entering into a combination are old does not necessarily negative

> the existence of invention. Diamond Rubber Co. v. Consolidated Rubber Tire Co., 220 U. S. 428 (1911); Iron Fireman Mfg. Co. v. Industrial Engineering Corp., 89 F. (2d) 904 (33 USPQ 277) (C. C. A. 7, 1937). Such a combination may be patentable invention if it produces a new result, or an old result in a new or more efficient way. Independent Oil Well Cementing Co. v. Haliburton, 54 F. (2d) 900 (12 USPQ 175) (C. C. A. 10, 1932); N. O. Nelson Mfg. Co. v. F. E. Myers & Bro. Co., 25 F. (2d) 659 (C. C. A. 6, 1928); see Walker on Patents (Deller, 1937) 147-49."

Both the Board of Appeals and the Primary Examiner in the Patent Office admitted that the construction here claimed is novel.

The Examiner acknowledged in a Statement to the Board of Appeals that the several patents were referred to merely to "show several forms of coil antennas." Then he acknowledged,

> "It is admitted that none show appellant's structure, though all are similar in purpose and function." (Appellant's App. 68.)

The Board of Appeals agreed,

> "It may be conceded that these citations do not anticipate the terms of the appealed claims." (Appellant's App. 74.)

The Examiner stated that the most pertinent references are Graves, No. 2,039,988 (Appellant's App. 80), and Arias, No. 1,820,643 (Appellant's App. 75). One of these shows merely a flat wire in sinuous form, not even a plurality of coils. The Board of Appeals did not even mention this patent by name in its opinion. The other of these "most pertinent" references so characterized by the Examiner, Arias, was referred to by the Board only as disclosing a wire gauze, but appellant's claims recite wire mesh screens only as applied to opposite sides of the plurality of windings and respectively connected with the lead-in wire thereof.

The Board of Appeals did refer, however, to Bodoh (Appellant's App. 74), as having coils within metallic plate members, which act as capacitance elements. The Board of Appeals erroneously stated that appellant's wire mesh screens are similar in effect to those solid metal cylinders 14 and 15 of this patent. The Examiner did not even contend that there was any similarity in that respect. Appellant's wire mesh screens form antenna surfaces, but that is not true of those metal cylinders of Bodoh which are provided for shielding effect and that only.

The findings of the District Court appear to support the Examiner and the Board of Appeals in the Patent Office, that the references do not show appellant's structure, and, therefore, this structure is new.

The construction set forth in the claims was not obvious from the prior patents.

Not only do the patents not disclose appellant's structure as defined in the claims, but this structure was not obvious therefrom.

All of these patents here referred to, except Graves, were granted during 1931 and 1932. The effort then was to secure reasonably satisfactory radio reception while getting away from the long outside aerials then generally in use. These patentees were engaged in the obtaining of reasonably satisfactory local reception with a small antenna. At that time, the reception of foreign broadcasts was almost unknown, except with very large radio sets and long outside aerials. To build an antenna which could be installed within a portable radio set and still provide good foreign broadcast reception was not contemplated in those patents. Those devices were not aimed at providing nondirectional antennae which would have the capabilities of this invention. These are the objects of this invention as set forth in the specification.

No one of these prior patents is capable of accomplishing these objects. They did not involve the problems, nor accomplish the results of this invention. Therefore, they would not suggest to any ordinary mechanic skilled in this art how to provide a compact non-directional radio antenna that could be built into a portable radio set and get universal reception at all times.

The radio art advanced rapidly after 1931, but for many years thereafter the art did not know how to accomplish appellant's results—a non-directional compact radio antenna capable of clear and distinct long-distance (foreign) broadcast reception. If this had been obvious from the 1931 patents it would have been made long before.

Carbide & Carbon Chemical Corp. v. Coe, 69 App. D. C. 372; 102 F. (2d) 236:

> "For mere skill of the art would normally have been called into action by the generally known want." Paramount Publix Corp. v. American Tri-Ergon Corp., 294 U. S. 464, 474, 55 S. Ct. 449, 79 L. Ed. 997, 1935. See also United Shoe Machinery Corp. v. E. H. Ferree Co., 64 F. (2d) 101, 103, 2 Cir. 1933, where the court said: "One of the safe tests of patentability is to inquire as to the condition of the art and the call for improvement."

Appellant discovered a structure which would accomplish these results and this is the structure that is set forth in his claims. It does not involve merely a single loop or a single coil. It involves a plurality of windings which must be arranged one within another; they must be in compact relation; they must be individually and respectively connected at one end only with a lead-in conductor, which conductor extends into the innermost coil for that purpose. That is the structure recited in appellant's claims 2 to 5. It is preferable, as recited in claims 3, 5, 6 and 7, to associate with the flattened windings the wire mesh screens on opposite sides thereof. These are not electrostatic shields as pointed out above, but are antenna surfaces. Cooperating with the windings, they provide the non-directional character of the antenna with large surface reception over a wide band and yet long range (foreign) broadcast reception, even though constructed in very compact form, capable of being assembled in a portable radio set.

This involved a new concept, one not obvious from these prior patents. The latter were not designed to accomplish appellant's results, and would not do so.

The construction claimed possesses patentable utility.

The District Court found that the invention here involved was not shown to produce any new or unexpected result that would be superior to the arrangements shown in the prior patents. It is submitted that this finding was erroneous.

Appellant produced an antenna as Exhibit 2, constituting an embodiment of his invention, and a similar unit in an assembled receiving set which was marked Exhibit 3. The latter was demonstrated in court where a reception could be observed. Even though the demonstration was in the daytime when foreign reception ordinarily is impossible with the average radio set, appellant demonstrated not only the reception of local stations but many foreign stations as well (Appellant's App. 18).

Furthermore, the witness, Ebbert, testified extensively as to his experience with appellant's antenna which he used for several weeks, far better than anything used before, although he had previously tried Philco, R. C. A. and Zenith antennae. He testified as to the appellant's antenna:

> "Finally he gave me one of the sets to try, and I used it for several weeks and it worked for me the same as it had in his place, so I got stations clearly that I never had heard before, and we would sit around all evening listening to Germany, and France and the

> Belgian Congo, and England, and we could hear those stations as clearly as the local broadcast.
>
> * * * * * *
>
> "3. Q. Did you find any directional effect in this?
>
> A. No. I live in an apartment house, steel and concrete, and we have steel on the windows and, before, when I was using my set, in order to cut out some of this interference, I would leave my windows open and use considerable insulation around the radio wires. I have been using this with the windows closed. I notice no difference now that the screens are out and the windows are open or closed, with the arrangement." (Appellant's App. 32.)

During the prosecution of this application in the Patent Office, appellant filed the affidavits of fifteen disinterested persons all of whom have made tests of appellant's invention and found that when used with different receiving sets the results secured by this antenna are superior to any results secured with the same sets using the standard aerials, which are part of the equipment usually sold or recommended for use with such sets.

It will be observed, especially from the second affidavit of Roger W. Barrington (Appellant's App. 56) who has qualified as an expert in radio apparatus, showing many years of experience, and whose qualifications are not questioned, that he made a complete test and ascertained without question that the Blanchard antenna eliminated fading, improved the clarity of reception, brought in many foreign stations not perceptible with a standard aerial, and, in other words, performed in accordance with the claims of the inventor.

The attention of the court is called particularly to the statement of this Barrington affidavit:

> "that from deponent's training and experience he is convinced that the said Blanchard antenna is the result of development and not design, thereby making

> it possible to attain results such as cannot be foreseen or explained by known rules and formulas, and in view of which facts existing terminology cannot be applied to it;"

While this affidavit is very full and complete, the affidavits by other parties, found in the record, are to the same effect.

The Examiner admits that the affiant, Roger W. Barrington, "appears to be experienced and well qualified for testing radio apparatus". He admits that the affidavit states that appellant's antenna showed a great improvement in signal strength over a loop antenna, or a normal sixty foot outside antenna, a definite improvement in quality, general fading reduced and selective fading eliminated.

The Examiner apparently gave little or no credit to these sworn statements. He seemed to feel that this apparently remarkable action of appellant's device, was improbable, notwithstanding the affidavits. The Examiner thought that the affidavit of Barrington should have stated that both appellant's device and the other aerials were applied to receivers in the same duration.

It would be highly impractical for appellant to fulfill the requirements of the Examiner as to tests. It would take the laboratory of R. C. A. to meet his demands. Such requirements place a premium on great laboratories of invention and would lead to the granting of patents only to those patent holding corporations who are engaged in research and capable of making the kind of tests which the Examiner demands. Such a reward to inventing laboratories is not favored by this Court, and should not be encouraged by approval of the present action of the Patent Office.

The Patent Office has granted these six patents, and many more, on radio antennae that are mere modifications of the old loop antenna then in common use, without insisting upon such laboratory tests as required in this case. Where appellant has made so substantial a showing of practical utility as has been presented here, this is full compliance with the statutory requirement for utility.

Walker on Patents (Deller's Ed.), Vol. 1, p. 311:

> "Improvements for which a patent may be granted must be new and useful; but the requirement of the statute in that respect is satisfied if the combination is new and the machine is capable of being beneficially used for the purpose for which it was designed, as the law does not require that it should be of such general utility as to supersede all other inventions in practice to accomplish the same object. *Seymour v. Osborne,* 11 Wall. (78 U. S.) 516, 20 L. Ed. 33 (1871); *Callison v. Dean,* 70 F. (2d) 55, 58, C. C. A. 10 (1934); *Union Simplex Train Control Co. v. General Ry. Signal Co.,* 11 F. Supp. 854, 859, D. C. W. D. N. Y. (1935)."

Seymour v. Osborne, 78 U. S. 516, 548-549:

> "Improvements for which a patent may be granted must be new and useful, within the meaning of the patent law, or the patent will be void, but the requirement of the patent act in that respect is satisfied if the combination is new and the machine is capable of being beneficially used for the purpose for which it was designed, as the law does not require that it should be of such general utility, as to supersede all other inventions in practice to accomplish the same object."

Hildreth v. Mastoras, 257 U. S. 27, 34:

> "The machine patented may be imperfect in its operation; but if it embodies the generic principle, and works, that is, if it actually and mechanically performs, though only in a crude way, the important function by which it makes the substantial change claimed for it in the art, it is enough."

Lamb Knit Goods Co. v. Lamb Glove & Mitten Co. (C. C. A. 6), 120 Fed. 267, 272:

> "It may be more or less useful than other gloves. That is unimportant. If it is a useful article, and it is new, it is the proper subject of a patent, provided it involved invention to produce it."

In re Holmes (C. C. P. A.), 63 F. (2d) 242, 243:

> "We are in accord with the views expressed in the cases cited that, if an invention be useful in itself, it is immaterial upon the question of patentability whether the invention be of greater or less usefulness than like devices or products shown in the prior art."

The showing here made not only by appellant's own testimony and demonstration, but also by the testimony of a competent witness, supported by the affidavits of fifteen disinterested persons, clearly establishes that appellant has secured not only superior results with this invention, but distinctly new results in the respects named in this patent application. This is an unusual showing of utility and improvement and entirely sufficient to support the patentability of the claims.

The prior patents are not the equivalents of appellant's invention because they cannot accomplish appellant's results. Not one of the patents suggests that it could get foreign broadcasts at all. Appellant's invention was especially designed for that purpose, but in a compact non-directional antenna for a portable radio set. It should be clear that the structure claimed was not obvious for accomplishing these results.

Miehle v. Whitlock (C. C. A. 2), 223 F. 647, 649:

> "Past experience has shown us that what may seem obvious after disclosure was not obvious before, even to persons skilled in the art. *Brunswick Balke Co. v. Thum,* 111 Fed. 904, 50 C. C. A. 61; *Schenck v. Singer Mfg. Co.,* 77 Fed. 841, 23 C. C. A. 494."

Webster Loom Co. v. Higgins et al., 105 U. S. 580:

> "But it is plain from the evidence and from the very fact that it was not sooner adopted and used that it did not for years occur in this light to even the most skillful persons. It may have been under their very eyes, they may almost be said to have stumbled over it, but they certainly failed to see it, to estimate its value, and to bring it into notice. * * * Now that it has succeeded, it may seem very plain to anyone that he could have done it as well. This is often the case with inventions of the greatest merit."

It will be clear from the foregoing that the claims define a new and patentable invention which is a great improvement in this art and merits the protection of a patent. Accordingly, it is submitted that the judgment be reversed, and that a decree be entered adjudging appellant to be entitled to a patent on the subject-matter of the claims here involved.

Respectfully,

J. Preston Swecker,
Attorney for Appellant.

Wilbur W. Williamson,
Of Counsel.

Washington, D. C.,
May 26, 1945.

JOINT APPENDIX.

Case No. 8982.

IN THE DISTRICT COURT OF THE UNITED STATES,
FOR THE DISTRICT OF COLUMBIA.

Civil Action No. 21,039.

Benjamin Waite Blanchard, Jr.,
Plaintiff,
v.
Conway P. Coe, Commissioner of Patents,
Washington, D. C.,
Defendant.

BILL OF COMPLAINT AS AMENDED TO ENFORCE ISSUE OF PATENT.

To the Honorable Judges of the District Court of the United States for the District of Columbia:

The Plaintiff brings this cause of action, and states as follows:

I. The Plaintiff, BENJAMIN WAITE BLANCHARD, JR., a citizen of the United States, is a resident, inhabitant, and citizen of the United States, residing in Camden, County of Camden, and State of New Jersey, whose postoffice address is P. O. Box 269, Camden, New Jersey; and brings the suit.

II. The Defendant, CONWAY P. COE, is the Commissioner of Patents of the United States (whose Official residence is in Washington, in the District of Columbia), and is sued as the Commissioner of Patents of the United States.

III. This Bill is filed in accordance with the provisions of Section 4915 of the Revised Statutes of the United States as amended (44 Stat. L., 1335).

IV. BENJAMIN WAITE BLANCHARD, JR., on April 7, 1939, filed in the United States Patent Office an application for patent for certain improvements in RADIO ANTENNA, and in accordance with the Statutes of the United States and the Rules of Practice of the United States Patent Office in such cases made and provided, the said application was given Serial No. 266,453.

V. The said application of Benjamin Waite Blanchard, Jr., was duly executed under and in compliance with the said Statutes and Rules of Practice, and was passed upon by the Primary Examiner who finally rejected and refused to allow claims 2 to 7, said claims reading as follows:

> 2. A radio antenna, comprising a plurality of flattened wire windings of different longitudinal and transverse measurements, nested together with their sides in relatively close parallel relation to one another, a metallic conductor extending through the smallest winding and to which one end of said smallest winding is connected, the other end of said winding being open, second and third metallic conductors outside of the opposite ends of said windings extending substantially parallel with said first conductor, one end of the outside winding and one end of an intermediate winding being connected to said last mentioned conductors respectively, the opposite ends of said outside and intermediate windings being open, and a longitudinally extending conductor connecting said first, second and third conductors and providing an antenna lead for connection to a radio receiving device.
>
> 3. A radio antenna, comprising a plurality of flattened wire windings of different longitudinal and transverse measurements, nested together with their sides in relatively close parallel relation to one another, a metallic conductor extending through the smallest winding and to which one end of said smallest winding is connected, the other end of said winding being open, second and third metallic conductors outside of the opposite ends of said windings extending

substantially parallel with said first conductor, one end of the outside winding and one end of an intermediate winding being connected to said last-mentioned conductors respectively, the opposite ends of said outside and intermediate windings being open, a longitudinally extending conductor connecting said first, second and third conductors and providing an antenna lead for connection to a radio receiving set, and wire mesh screens upon the opposite flattened sides of and parallel with the common plane of said windings, the opposite ends of each screen being also connected to said longitudinally extending conductor by leads of different lengths.

4. A radio antenna, comprising duplicate sets of a plurality of flattened windings of different longitudinal and transverse measurements, nested together with their sides in relatively close parallel relation with one another, a metallic conductor extending through the smallest winding of each set and to which one end of each of the smallest windings is connected, the other end of each smallest winding being open, second and third metallic conductors outside of the opposite ends of said winding sets extending parallel with said first conductor, one end of the outside winding and one end of an intermediate winding of each set being connected to said last-mentioned conductors, respectively, the opposite ends of the outside and intermediate windings of each set being open, and a longitudinally extending conductor connecting said first, second and third conductors and providing an antenna lead for connection to a radio receiving set.

5. A radio antenna, comprising duplicate sets of a plurality of flattened windings of different longitudinal and transverse measurements, nested together with their sides in relatively close parallel relation with one another, a metallic conductor extending through the

smallest winding of each set and to which one end of each of the smallest windings is connected, the other end of each smallest winding being open, pairs of metallic conductors at the ends of said windings sets extending parallel with said first conductor, one end of each of the outside windings of each set being connected to one of the conductors of each end pair, and one end of each of the intermediate windings of each set being connected to one of the conductors of the other end pair, the opposite ends of said outside and intermediate windings being open, and wire mesh screens upon the opposite flattened sides of and parallel with said windings, one end of each of said screens being connected to one conductor of one end pair and its other end being connected to the opposite conductor of each end pair to provide connecting leads of different lengths, and a conductor extending longitudinally of and between said winding sets to connect said first conductor and said pairs of end conductors together, and provide a lead for connection to a radio receiving device.

6. A radio antenna, comprising a plurality of flattened windings, one within another and having their sides in relatively close parallel relation, a pair of wire mesh screens upon the opposite sides of said windings, one end of each winding being open and the other ends of said windings being connected with spaced portions of said screens to a conductor forming a lead for connection to a radio receiving device.

7. A radio antenna, comprising a plurality of flattened windings, one within another and having their sides in relatively close parallel relation, said windings being of substantially the same lateral extent and comprising substantially the same number of turns, a pair of wire mesh screens upon the opposite sides of said windings, one end of each winding being open and the

other ends of said windings being connected with spaced portions of said screens to a conductor forming a lead for connection to a radio receiving device.

VI. After the final rejection and refusal of said claims by the Primary Examiner, the applicant, BENJAMIN WAITE BLANCHARD, JR., appealed from the decision of the Examiner to the Board of Appeals of the United States Patent Office, who on February 26, 1943, affirmed the decision of the Primary Examiner.

VII. The grounds of rejection urged by the Primary Examiner and by the Board of Appeals against the allowance of the said applicant, BENJAMIN WAITE BLANCHARD, JR., of said rejected claims 2 to 7 inclusive, were:

1. That the claims were unpatentable over certain prior patents, to wit:

Speaker	1,828,910	October 27, 1931
Arias	1,820,643	August 23, 1931
Clark	1,879,978	Sept. 27, 1932
Bodah	1,850,914	March 22, 1932
Jones	1,840,780	January 12, 1932
Graves	2,039,988	May 5, 1936

VIII. In view of the said decision of the Board of Appeals, the Defendant, Conway P. Coe, Commissioner of Patents, has refused and still refuses to allow the said claims 2 to 7 inclusive of said application, which claims Plaintiff has insisted and still insists are allowable and patentable to Benjamin Waite Blanchard, Jr.

IX. No appeal has been taken from the decision of the Board of the Appeals of the United States Patent Office to the Court of Customs and Patent Appeals, and no such appeal is pending or has been decided.

X. The Plaintiff further alleges that the said invention as expressed in said claims 2 to 7 inclusive, of said application is new and useful and was not known or used by others in this country before the invention thereof by the said Benjamin Waite Blanchard, Jr., and was not patented or described in any printed publication in this or any foreign country before the invention thereof by the said Benjamin Waite Blanchard, Jr., or more than two years prior to the said Benjamin Waite Blanchard, Jr.'s original application for patent therefor in this country, and was not in public use or on sale in this country for more than two years prior to the said original application, and was not patented in any foreign country by the said Benjamin Waite Blanchard, Jr., or his legal representatives or assigns on an application filed more than twelve months prior to the said Benjamin Waite Blanchard, Jr.'s invention and application in this country, and was not abandoned.

XI. WHEREFORE, the Plaintiff prays that this Honorable Court shall review and reverse the decision of the Board of Appeals and of the said Defendant, Conway P. Coe, Commissioner of Patents; shall adjudge that the Plaintiff is entitled, according to law, to receive a patent for the invention specified in said claims 2 to 7 of said application, and shall authorize the said Defendant, Conway P. Coe, to issue a patent to the Plaintiff containing said claims on the filing in the Patent Office of a copy of this Court's adjudication and otherwise complying with the requirements of law; and for such other and further relief in the premises as the nature of the case may require and that to this Honorable Court shall seem meet.

BENJAMIN WAITE BLANCHARD, JR.,
By MASON & MASON,
Attorneys and Counsel for Plaintiff,
By JOHN M. MASON,
Counsel for Plaintiff,
841 Munsey Building,
Washington, D. C.

Washington, D. C.,
August 24, 1943.

ANSWER TO THE COMPLAINT, AS AMENDED.

To the Honorable the Justices of the District Court of the United States for the District of Columbia:

I, II, III, IV, V, VI, VII. Defendant admits the allegations of paragraphs I to VII, inclusive.

VIII. He admits that he has refused and still refuses to issue to plaintiff a patent containing claims 2, 3, 4, 5, 6 and 7, as set out in paragraph V, since said claims are deemed to be unpatentable in view of the following prior patents and for the reasons given in the statement of the examiner in answer to the appeal and the decision of the Board of Appeals, copies of which will be furnished at the trial:

Speaker	1,828,910	October 27, 1931
Arias	1,820,643	August 23, 1931
Clark	1,879,978	Sept. 27, 1932
Bodah	1,850,914	March 22, 1932
Jones	1,840,780	January 12, 1932
Graves	2,039,988	May 5, 1936

Profert of copies of these patents is hereby made.

IX. He admits the allegations of paragraph IX.

X. He admits that plaintiff, in his application for patent, made allegations corresponding to the allegations of paragraph X, but avers that these allegations are not sufficient to justify the issuance of a patent to him containing claims 2, 3, 4, 5, 6, and 7 of his application for patent Serial No. 266,453, and avers that plaintiff is not entitled to receive such a patent since these claims are deemed to be unpatentable for the reasons set out in paragraph VIII of this answer.

W. W. Cochran,
Solicitor, U. S. Patent Office,
Attorney for Defendant.

October 8, 1943.

I hereby certify that a copy of this ANSWER TO THE COMPLAINT AS AMENDED was mailed to the attorney for plaintiff, Mr. John A. Mason, Munsey Building, Washington, D. C., on October 8, 1943.

W. W. COCHRAN,
Solicitor.

FINDINGS OF FACT.

1. This is an action under R. S. 4915 (U. S. C., title 35, sec. 63) in which it was sought to have the Court find that the plaintiff, Benjamin Waite Blanchard, Jr., is entitled to have issued to him a patent containing claims 2 to 7, inclusive, of his application No. 266,453 for patent on a radio antenna.

2. The application here involved discloses an antenna comprising three flat windings arranged one within the other and mounted on a wooden framework, the windings being connected together at one end by metal rods arranged in the form of a grid. A metal screen is located on each of the flat sides of the windings and these screens are connected to each other and to the connected ends of the windings.

3. The patent to Arias No. 1,820,643 discloses a radio antenna comprising a metal screen supported on a frame and forming in effect an elongated box open at the ends and having a square cross section.

4. The patent to Speaker No. 1,828,910 discloses a radio antenna comprising a winding of insulted wire wound on a metal cylinder.

5. The patent to Jones No. 1,840,780 discloses a radio antenna which includes inner, outer and intermediate winding sections or layers arranged one within the other so that the outer layers electrostatically envelop the inner ones.

6. The patent to Bodoh No. 1,850,914 discloses a radio antenna comprising a wire winding having inner and outer layers, which winding is supported between inner and outer metal cylinders.

7. The patent to Clark No. 1,879,978 discloses a radio antenna comprising two flat wire windings arranged one within the other.

8. The patent to Graves No. 2,039,988 discloses an antenna formed by a wire sinuously arranged in a single plane and supported between sheets of insulating material.

9. In view of the various arrangements of metal windings and of wire screens in radio antennæ as disclosed by the prior patents, the particular arrangement of windings and screens claimed by the plaintiff involves nothing more than ordinary skill of the mechanic.

10. It has not been shown that the particular arrangement set forth in the claims involved in this action produces any new or unexpected result or is superior to the generally similar arrangements disclosed in the various prior patents.

11. None of the claims set forth in the complaint defines invention in view of the prior art.

12. All the claims set forth in the complaint are unpatentable in view of the prior art.

CONCLUSIONS OF LAW.

1. The plaintiff is not entitled to a patent containing any of the claims set forth in the complaint.

2. The complaint should be dismissed as to all the claims involved.

JUDGMENT.

This action came on to be heard at this term and thereupon, upon consideration thereof, it is this 31st day of October, 1944

Adjudged that the complaint in this case be, and the same hereby is dismissed with costs against the plaintiff.

NOTICE OF APPEAL.

Notice is hereby given that Benjamin Waite Blanchard, Jr., plaintiff in the above-entitled cause, hereby appeals to the United States Court of Appeals for the District of Columbia from the final judgment entered in this action on October 31st, 1944.

TESTIMONY.

Mr. Mason: May I hand up this certified copy of the file wrapper?

The Court: Are you offering that in evidence?

Mr. Mason: Yes.

The Court: As Plaintiff's Exhibit No. 1?

Mr. Mason: Yes.

The Court: Without objection it will be received.

(The file wrapper and contents in the matter of the pending application of Benjamin Waite Blanchard, Jr., filed April 7, 1939, Serial No. 266,453 for improvement in radio antenna was thereupon received in evidence and was marked "Plaintiff's Exhibit No. 1.")

BENJAMIN WAITE BLANCHARD, Jr., the plaintiff herein, was called as a witness for and in his behalf, and having been previously duly sworn as more particularly in this record appears, assumed the witness stand and, upon examination, testified as follows:

Direct Examination.

By Mr. Mason:

1. Q. You are Benjamin Waite Blanchard, Jr.?

A. I am.

2. Q. Mr. Blanchard, will you tell us, or tell the Court, what your qualifications are; what education you have had in the electrical line and how long you have been in the electrical business?

A. Well, I am sixty years old.

I started in the electrical business when I was about twenty-two.

I had no previous education in the electrical field. I got mine the hard way.

My radio knowledge dates back to about six years, approximately six years.

During the last three years I have been doing work for the War Department in research.

3. Q. Are you employed continuously at that work?

A. At the present time, yes, sir.

4. Q. What does that consist of, Mr. Blanchard?

A. Well, building and designing antennas for the field sets, transmitting and receiving, testing and various things like that.

5. Q. Have you been to the Pentagon Building?

A. I have been working on the problem of taking the mast off the big command cars, because the masts were a target for the bombers; whenever the enemy bombers came over and saw a car or truck with the masts on it, they knew that was "communications" and immediately started to bomb those communications.

I have remedied that by placing a tube underneath the truck, in the chassis, and have increased the range of these GE sets and Crosley sets from seventeen miles, and I have gone as far as Florida and Chicago and have eliminated a lot of the difficulties that they had previous to that with the masts.

6. Q. Have you been called to the War Department in the Pentagon Building and have you consulted officers there in connection with your set, this radio antenna?

A. Yes, sir.

7. Q. How long ago was that?

A. Well, if you can remember the night I was at your house.

8. Q. Well, we will say approximately a month ago?

A. Three or four weeks ago, yes.

9. Q. Just what did you do there?

A. Why, I demonstrated the small antenna on the portable field set, the Crosley.

10. Q. Is that antenna you were using essentially the same as this one you have here?

A. Well, I would say not.

11. Q. You have coils in that antenna?

A. Yes.

12. Q. You have screens also in that antenna?

A. No screens.

13. Q. You do not have this part (indicating)?

A. No, sir.

14. Q. I see.

Have you been able to compare the disclosure of your application, in other words, the disclosure embodied in this model and that one (indicating) with the disclosure on other antennas?

In other words: Have you tried other antennas on your set and also compared this antenna with it?

A. I have continuously tried varied antennas for the past five years, and I do not think there is an antenna I have not tried.

15. Q. What were the results of those tests?

A. Well, they did not compare with my antenna.

16. Q. In what respect?

A. Well, as to range; as to selectivity; as to fading.

17. Q. When comparing these other aerials to your aerials, you found that your aerial was superior to those other aerials, the various ones you tried, as to directional effect?

A. Mine have absolutely no directional effect.

18. Q. What do you mean by "directional effect"?

Please indicate that to the Court.

A. Well, turn the antenna around this way and you would change the capacity effect of the antenna. In other words, you would throw it off frequency.

19. Q. And this set or——

A. (Interposing) In the other sets I have tried.

In this set it does not make any difference.

20. Q. What about body capacity?

A. No body capacity. There is no body capacity in mine, but there is in the others.

21. Q. Will you explain to the Court what you mean by "body capacity"?

A. Well, laying my hand on here (indicating) there is always a certain amount of capacity in everyone's body, because the body is the best antenna you can get.

Of course, a person would not stand with his finger on a radio long.

If the antenna did not have proper capacity and I laid my hand on it, the strength of the signal would immediately get stronger, but, as I would lay my hand on the antenna, there is absolutely no change whatever in the signal.

22. Q. In your set?

A. In my set, which proves that there is no body capacity.

23. Q. But in other sets?

A. It happens that way.

24. Q. They have body capacity?

A. Yes, sir.

25. Q. What is your conclusion as to static discharges for this set and for other aerials that you have tried out?

What about that, particularly?

A. Of course, static is an atmospheric condition and it is pretty hard to reach a definite conclusion on anything like that.

The only thing I could say would be that there is less static on mine, on my antenna, than I have found on any others.

We call it a high noise level.

26. Q. What about the fading?

A. Well, there is considerable selective fade on other antennas; in fact they are noted for their selective fade.

My antenna never produces a selective fade.

A selective fade is something that goes out and you cannot get it back.

27. Q. What about the ability of this aerial to pull in stations that other aerials were not able to pull in?

A. Well, in my tests, over a period of five years or more, I have found that the conventional aerial or antenna does not pull in very many distant stations.

28. Q. And yours?

A. Mine does.

29. Q. What do you mean by "does"?

A. Well, mine will bring in Australia, Johannesburg, South America, it will bring in the Allied Headquarters at Algiers; it will bring in London on four or five frequencies; it will bring in Germany, and bring in France and off-channel too, and when I cannot get that, that is when the beam is not directed on this country.

I can pick up England at night, after she leaves the North American beam and her beam is directed to Australia. That is, it is not coming across the Atlantic, but the Pacific.

In other words, we are twelve thousand miles from Australia and New Zealand. I do not know how many miles Australia is from England, but you would add that to the twelve thousand miles, and it is practically almost around the world, with the exception of the three thousand miles that would be the span between the United States and England in the Atlantic Ocean.

30. Q. Now, Mr. Blanchard, I have, as you will have noticed, shown this to the Court, this being more or less a dissembled set.

Say that the dissembled set is "Plaintiff's No. 2."

(Thereupon the dissembled set above referred to was received in evidence and was marked "Plaintiff's Exhibit No. 2.")

THE COURT: And mark the assembled set as "Plaintiff's Exhibit No. 3."

(Thereupon the assembled set above referred to was received in evidence and was marked "Plaintiff's Exhibit No. 3.")

By Mr. Mason:

31. Q. Mr. Blanchard, will you show the Court the inside of that set, "Exhibit No. 3"?

A. Yes (exhibiting the unit to the Court).

That (indicating) is dipped in wax to keep the moisture off of it.

32. Q. And Exhibit No. 3 is the same as Exhibit No. 2 except it is connected?

Is that correct?

A. Except that it is connected and has this small resistant winding on it.

33. Q. Does this resistant winding in Exhibit No. 3 affect the reception to any extent?

A. Oh, yes. It has a great deal to do with it; on that disjointed model there, I do not have any winding. That is wound on a piece of fiber and slipped on the rod.

34. Q. When you use Exhibit 2 or Exhibit 3, is your reception about the same?

A. Practically the same. The resistance winding has the effect of the different metered points.

35. Q. Mr. Blanchard, I show you a circular which will be marked as "Plaintiff's Exhibit No. 4" if there is no objection.

The Court: There seems to be no objection.

(A document issued by "The Hallicrafters, Inc." was thereupon received in evidence and was marked "Plaintiff's Exhibit No. 4.")

By Mr. Mason:

36. Q. Is this Exhibit No. 4 that I show you illustrative of and the same as this set you have there?

A. The picture refers to SX-25 and the instrument that refers to SX-25 is on the left-hand side.

37. Q. That is on page 6 of the exhibit.

You point out to the Court the page that shows your set.

A. This page is 6, yes.

38. Q. Page 6 shows the set?

A. Yes.

39. Q. Is this the set bought by amateurs or others who want to get far reception or is it an expert set?

A. It is not an expert's set. It is an amateur set.

40. Q. It is an amateur set?

A. Yes. It is a receiver. In fact, I had to mention that fact, I have a Stromberg-Carlson 250, models 250 and 260, wired ten times as good as that and this will knock that cold.

41. Q. Would your Honor care to listen to a few stations that may be pulled in on this set?

The Court: I do not mind it.

42. Q. Will you proceed with your demonstration?

A. (Demonstrating) That is England.

43. Q. Just keep changing the stations.

A. I wanted him to announce this.

(The demonstration was continued.)

The Witness: There is some electrical interference. It may be the elevator. I do not know.

That is 1500.

By Mr. Mason:

44. Q. I would like to hear the foreign stations.

A. That is 1340.

That is 1260.

There is terrific electrical disturbance.

That disturbance is coming in here (indicating).

That is 980.

That is 660.

I don't know how many stations you have here.

I guess that covers it.

45. Q. Well, have you any foreign stations?

A. (Resuming the demonstration) Of course, remember, you have not anything in this country in the afternoon from foreign stations.

That is ignition noise.

That is your station standards.

That is Germany.

That is Brayersville.

(The demonstration was continued with further and then concluded.)

By Mr. Mason:

46. Q. May I ask you before we finish——

A. (Interposing) Mr. Mason, there is one thing I think should be explained——

47. Q. (Interposing) Just a minute.

Are you able to bring into hearing daytime foreign stations such as England, Germany, France and other places?

Is that correct?

A. Yes.

48. Q. Now, what was your remark?

A. I should explain that in the Patent Office, of course, and they will bear me out in this, with their experts over there, you will have certain meter bands at certain times of the day that are not operated.

In other words, 49 meters in the daytime are not supposed to be operated in this country; neither is 41 or 42. 31 may be in the afternoon, late afternoon, and 25 is possibly starting from about this time, but you would have to get your set in some place where you could ground it off and get rid of electrical disturbances and to eliminate that electrical disturbance.

Of course, in a home, that would never happen.

49. Q. Mr. Blanchard, is it true that you could eliminate most of the noise that we heard here if the set was permanently installed?

A. Oh, yes.

50. Q. How?

A. This is ground connection here (indicating). Put a ground wire on it or put a good ground there, and that will take off any interference you hear.

That could be an electric elevator or some transformer or some sort of recording device, or something in that way. But it is A. C. line noise.

51. Q. Mr. Blanchard, you are familiar with the patents which the Patent Office has cited against your application.

You have read those patents?

A. I have glanced them over, Mr. Mason.

52. Q. I wanted to show you the Bodah patent, No. 1,850,914, and I would like you to look at that and tell me what you consider that is.

A. Well, that is merely a coil. That is not winding. And, it has not any paralleling.

I always found when I wound a coil it acted more or less as a choke.

If I wanted to eliminate—five or six years of experience, in that time I never would attempt to wind a coil like this excepting to get reception.

53. Q. Is there a difference in your opinion between coils that is wire wound on a cylinder and flat winding such as indicated in your model, Exhibit No. 1?

A. Yes, in my——

THE COURT (interposing): You mean Exhibit No. 2.

By MR. MASON:

54. Q. In your Exhibit No. 2?

A. There is a vast difference.

55. Q. There is a definite advantage on that?

A. You mean on the cylinder?

56. Q. In your set over the cylinder?

A. Yes, absolutely, as I have probably 100 or 150 different models of antennas that I have worked on during this period of five or six years, a little over five years, and I have failed yet to find anything that compared with this.

By The Reporter:

57. Q. You have "failed yet to find anything that compared with this"?

A. Yes. The Patent Office has that antenna.

The Chief Examiner, Mr. Backus, his sister has one of these antennas. I hooked it up for her and she got England, Germany and France in the afternoon.

By Mr. Mason:

58. Q. Mr. Blanchard, in connection with the patent which you have there, you will note that there are two metal cylinders, one on the inside and one on the outside?

A. I did not read the specifications. I do not know whether they are metal or fiber, which they are.

59. Q. If they are metal cylinders as the specifications state, would that be the equivalent to the screens you have here, in your opinion?

A. No, sir.

60. Q. Particularly if these metal cylinders are unconnected with his coils?

A. Well, there must be some form of insulation there between the cylinder and the coil.

61. Q. In the patents, the cylinders are unconnected with the coils.

I assume that; I read the specifications itself.

I ask you whether that makes a difference, if these metal cylinders, unconnected with coils, as compared with your set which discloses windings electrically connected with screens—if that makes a difference.

Is that, in your opinion, an entirely different construction?

A. Mine is entirely different, yes.

There would be no comparison between the two.

In the first place he has one cylinder inside of another, which he uses as a trimmer; he pulls this out here (indicating) in order to trim to the frequency he is working in.

You have no trimmer on that (indicating). That hits all bands.

62. Q. I next show you this patent to Arias, No. 1,820,643.

THE WITNESS: You remember the old automobile antenna, before they put on turret tubes on the old canvas top. You remember they put a piece of wire screen between the upholstery and the top.

This is merely put into four sides; that is all he has, and I notice he makes no claims outside of that at all.

By MR. MASON:

64. Q. In other words what this patent shows is a four-sided screen with no coils?

A. Yes.

65. Q. How would such a screen compare with a reception from your aerial?

A. Well, it could not compare, Mr. Mason, any more than you take one or two or four of these screens and box them together, and join them, and you would not get much reception off that. You may get some local stations, the same as you put a wire around the picture moulding in your home, or throw it out the window.

66. Q. Next is the patent to Graves, No. 2,039,988.

What do you think of the patent disclosure in that case?

You recall that there is a wound wire in that patent?

A. Well, he has two things here: One is a table scarf and the other a rug. In the rug, he holds the wire in the rug some way or other, weaves it in, or something—I don't know what his method of procedure is, although I think down here that that wire is woven in.

I would say if you laid that on the floor and walked on it you would get nothing but static. If you laid it on the table and put a lamp over it, or something like that, you would create static.

Now these are both open ended.

67. Q. The next patent I show you is a patent to Clark, No. 1,879,978.

There is shown in that patent, I think, one figure—I refer you to Figure 6, which shows the layout of the coils.

There are three coils: The first one is coil No. 9 and has both of its ends connected together. And those two ends are connected to a condenser and through that condenser to the second coil.

What would be the effect of that as compared with your set?

A. I would say that it would be inoperative. That would be like trying to hook up two antennas to get better reception, and if you hooked up two antennas you get less reception than if you had one.

I also see something else here that runs off to ground, through some sort of electrolytic jar, a jar of salt water two-thirds full of solution of salt water.

68. Q. I will come to that.

First I will ask you about the condensers: You have three condensers, one between each of the coils?

A. I see that.

69. Q. You have no condensers in your device?

A. No condensers.

70. Q. Now, what would be the effect of these condensers? Would it change the reception—over your device, I mean?

A. Well, I do not believe anyone could answer that question unless you put it to a test, because it all depends upon the function of the condenser and what the capacity of it is and the number of turns of wire, and the gauge of the wire.

71. Q. Putting it another way, what is the ordinary function of a condenser?

A. Either to reduce or increase.

72. Q. Either to reduce or increase current strength?

A. Yes.

73. Q. Without modifying it in any way?

A. Yes.

74. Q. In other words, you think the interposition of these condensers in there would not affect the set?

A. He first would have to get the vibrations in before the condensers would work.

It would not be like——

75. Q. (Interposing) What would be the——

A. (Interposing) Your passing electrical current through a radio set and through a condenser and into a tube or the grid of a tube.

Here he has no electrical effect in here at all.

76. Q. What would be the effect of running a wire through the jar of salt water as shown here?

A. That jar there (indicating)?

77. Q. At 20.

A. Well, I do not see any effect it would have any more than it might increase the strength of the ground, and if he is depending on ground wave and aerial wave at the same time, of course, he is amplifying with his ground wave.

78. Q. I will ask you to point out the main difference or improvement of your device over the Clark?

A. It is very evident. One thing here I am really surprised about and that is that the Patent Office would allow a patent like this.

I will quote from his specifications, at line 77, where he says:

> "It is contended that the best results are obtainable when the metal case is placed in a refrigerator such as a mechanical or other type of automatic refrigerator. In the absence of a refrigerator of this type it may be placed in ice. . . ."

79. Q. Do you place yours in a refrigerator or ice?

A. No.

80. Q. What effect do you think such placing would have?

A. Why, I cannot say, Mr. Mason. That is beyond me.

81. Q. I next show you the Speaker patent, No. 1,828,910.

The Speaker patent shows a metal plate, 12, which is directly connected with a metal cylinder, 13, upon which is wound an insulated wire, 21. 20 and 22 is insulatively connected to the cylinder and the cylinder A-23 is connected to the input, on a radio receiver.

How does that compare with yours?

A. Well, it is called an aerial eliminator, and I think it would all be answered in the first specification you gave me there, on that other coil, because this is a coil, a winding of 21 and insulated wire, that is this winding here (indicating) is raised in the form of the saline acid. Cylinder 13, one end of 20 to the winding is here (indicating) and is insulatively connected to the cylinder.

In other words, he dead-ends one of the wires to the cylinder while the other is connected through the output of the radio apparatus. He is depending upon the metal cylinder to be a pick-up for his winding and to create inductive capacity.

82. Q. In your opinion, would the device shown in that patent be as good in bringing in foreign stations as the aerial described in your application?

A. No.

83. Q. Why not?

A. Well, I think I cited my objections to a coil as being more or less of a choke, and not operative on radio vibrations.

84. Q. Whereas the winding is?

Is that your point?

A. Yes. A parallel winding is, but anything wound around and around acts as a choke.

If I want to make a choke to stop the wind noise that is what I would have to do, wind a cylinder more or less like that.

85. Q. The last is a patent to Jones, No. 1,840,780.

In looking over this patent I wish you would refer to the figures 1 and 2 and then to the figure 5.

A. I am more or less familiar with this patent because it was sold to R. C. A. by Mr. Jones, and the present figure 1 and 2, and he made a continuing patent over here that took in figure 5; 3, 4 and 5.

86. Q. Figure 5 in particular discloses——

A. (Interposing) Mr. Jones' own——

87. Q. (Interposing) Just a minute.

Figure 5 in particular discloses a wiring arrangement which is put over or encloses the structure shown in Figures 1 and 2.

A. He don't use that any more.

The Witness: This antenna here only operates from 550 kilocycles to 1500 kilocycles. That is as far as it goes, and it is directionally different; it goes in a pivot and you have to put your hand around there (indicating) and turn it in order to pick up the station you want to pick up.

By Mr. Mason:

89. Q. You spoke about kilocycles on which that aerial will operate.

Will you please compare that with your set with reference to the kilocycles on which your set will operate?

A. Well, I just demonstrated there that I had some 550 kilocycles—I went up to 15,000 kilocycles, not 1500, but 15,000—ten times greater than his.

90. Q. What stations are those in which you have 15,000 kilocycles?

A. England is a little above 15,000 kilocycles—nineteen meters.

91. Q. This device of the patent to Clark is not adapted for short wave receiving?

A. For broadcasting.

92. Q. It is for broadcasting?

A. Yes, sir.

Mr. Mason: Your witness.

CROSS-EXAMINATION.

By MR. REYNOLDS:

93. XQ. Have you actually tried the antenna to know, the antenna of any of these patents that are cited as references in your application, to know just what they will do?

A. No, I have not.

94. XQ. Have you ever compared your own device with the screens and without the screens?

A. Yes, sir.

95. XQ. And what was the result of that?

A. The results of that were that it operated much better with the screen than without it.

96. XQ. Did you ever try the screen without the coil?

A. Yes, sir.

97. XQ. What was the result of that?

A. Nothing any more than you get in any ordinary conventional antenna.

98. XQ. Could you try that here?

A. No, I did not.

99. XQ. I say: Could you?

A. I was demonstrating this antenna.

100. XQ. I say: Could you try that here now?

A. Yes.

101. XQ. Would you? That is, the screens without the coil.

A. One and two?

102. Q. Two. The screens without the coil.

A. It is difficult to do that.

103. XQ. Did you?

A. I——

104. XQ. (Interposing.). I want the screens just as they are without the coil.

(A demonstration was engaged in.)

THE WITNESS: Do you want the amplifier with the screens together?

MR. REYNOLDS: No. I want it like that (indicating) just as if the coils were not there.

THE WITNESS: You cannot hold them without getting body capacity. That is not fair.

By MR. MASON:

105. XQ. Could you put them on this box, take this box and put one screen on top and the other below it, without the aerial?

THE COURT: Would you space it with paper drinking cups?

(The witness followed the Court's suggestion.)

THE WITNESS: Of course, we really ought to have a different radio for this, because this radio is tuned to this box.

(A demonstration was engaged in.)

MR. REYNOLDS: That is enough for me.

THE WITNESS: How do you determine which is the best?

MR. REYNOLDS: I just wanted to see how it sounded.

MR. MASON: Just leave it there.

By MR. REYNOLDS:

106. XQ. Now, you testified that in your exhibit 3 there is a small resistance coil included at the end of the device. Is that right?

A. Yes.

107. XQ. With respect to the devices that you have described as having tested, did they include the coil?

A. What do you mean did they include the coil?

108. XQ. You testified to a number of comparisons you said you made between your device and others.

A. I tested with and without.

109. XQ. Did it make any difference?

A. Oh, yes.

110. XQ. It was better with the coil in?

A. With a little resistance winding on the end of the rod.

111. XQ. It is better with that in?

A. Yes.

112. XQ. That is not disclosed in your application, is it?

A. Yes.

113. XQ. It is?

A. Yes.

114. XQ. Will you point it out?

A. I am pretty sure it is.

This is supposed to be a tube that goes over the rod and the winding goes over that.

115. XQ. The winding is not shown in the drawing?

A. No, it does not seem to appear here in this plaque, but it should be shown here.

You can see what kind of a winding it is.

116. XQ. I am just talking about what is disclosed in the application?

A. Well, it would not make any difference even if you leave the resistance coil off.

117. XQ. Did not you say it was better?

A. I said it was better, but you could still get reception if it were left off.

Mr. Reynolds: That is all.

Re-Direct-Examination.

By Mr. Mason:

118. RDQ. Mr. Blanchard, you have testified on cross-examination in connection with this set and you have hooked it up.

Did you try any foreign stations?

The Court: Your question, I think, is too indefinite.

You testified in regard to two screens.

Mr. Mason: Yes; he testified in regard to two screens.

By Mr. Mason:

119. RDQ. Were those two screens—or, was your set tuned for a foreign station?

A. No. That was broadcast.

120. RDQ. Why don't you get that or a foreign station, or try to?

A. That is England (demonstrating).

121. Q. Will you disconnect that and put your own device on there?

(The witness did as requested.)

By Mr. Mason:

122. RDQ. Would that be the only station you are able to get with those screens?

A. The only one.

123. RDQ. Can you get any other with this one?

A. That is England broadcasting to Canada (demonstrating); if we leave it on we will be able to hear the announcement.

124. RDQ. What station is that?

A. England. This is 19 meters and the other at 25 meters.

125. RDQ. And both are what?

A. England.

Mr. Mason: O. K. That is all right.

By Mr. Mason:

126. RDQ. You have recently testified in connection with this wiring on the end.

A. You mean that resistance winding?

127. RDQ. The resistance winding?

A. Yes.

128. RDQ. This resistance winding is not in your application?

A. Evidently not.

129. RDQ. That is correct.

Now, you have said you did not get the same resistance with this resistance wiring as you do without it.

I would like you to explain it.

A. The reception is a little better with the resistance winding.

130. RDQ. How would you explain it, about what percentage?

A. Well, all antennas have a certain amount of resistance. That is the only test they make on the antenna. Whether transmitting or receiving, it is resistance.

In order to properly test it, you have to hook together a certain number of condensers in a series and in that way you get a resistance test on the receiving antenna.

On transmitting, it is just the opposite, you use a thermo couple meter. That depends on the radio frequency going through your themo couple meter. That is coupled in series with your transmitting set and your antenna.

131. RDQ. You do get very good reception when you do not use resistance?

A. I get good reception when I don't use resistance, yes, because I always have had good reception.

Mr. Mason: That is all.

Re-Cross-Examination.

By Mr. Reynolds:

132. RXQ. In this arrangement of the screens without the coils, these leads are not soldered?

A. They would not have to be in that.

133. RXQ. Would not the soldering of that connection possibly improve the result?

A. I don't think so. They are solid on there and if they were not there would be a jump in there that would be audible to the ear.

Thereupon JOHN H. EBBERT was called as a witness for and in behalf of the plaintiff herein, and having been previously duly sworn by the Clerk of the Court, as more particularly appears in this record, assumed the witness stand and, upon examination, testified as follows:

DIRECT EXAMINATION.

By MR. MASON:

1. Q. Mr. Ebbert, you have used one of these aerials as indicated in Exhibit 3, which I show you?

A. Yes.

2. Q. What has been your experience with that aerial as compared with others?

A. I have tried about most of the aerials on the market.

I live in an apartment house and have spent sums from five dollars to seventy-five dollars to install aerials on the side, on the roof, iron ones, copper ones, coils, and sometimes a piece of copper downspout, and then Mr. Blanchard told me about the aerial that he had, and I discounted it; I figured it was just another aerial, and frankly I did not want any more.

But, I went and listened to this for a few times and I decided maybe he had something.

In the meantime I changed sets.

I bought several different sets of radio and had pretty much the same result. I could get a couple of foreign stations, but when I would get them there would be an oscillation and a fading with the result that I tried to get another set and was going to get another set, and he told me that if a set would play anything he would bring it in; he could bring in anything.

Finally he gave me one of the sets to try, and I used it for several weeks and it worked for me the same as it had in his place, so I got stations clearly that I never had heard before, and we would sit around all evening listening to Germany, and France and the Belgian Congo, and England, and we could hear those stations as clearly as the local broadcast.

I also noticed after I returned the set to him that my original set that I had been using did seem to have some pep in bringing in the foreign stations, more pep as compared with them before, though not satisfactory on the 150 feet of wire I had, so I had them taken down to 90 feet, and then to 45 feet, and the results were better but last week, in the last week or so, the stations faded out in my aerial.

I have decided that this box must do something to the set as well as bring in the stations—it sort of energizes it.

Last Saturday a week ago I had a Chief Navy Engineer from Philadelphia visiting me and I told him about it and he said, to put it in his language, "It is the old baloney"; he had been up against a whole lot of these things and everybody had something that was better, and he said that no man had worked out a thing like I said this was.

Well, he had never been in my apartment and he did not know what I had and I thought that the best thing to do was to have him come to dinner, and let him go through my place, and he came up there and had dinner with me, and we played cards and I kept telling him about this box of Mr. Blanchard's, and he said that it could not be done because he has tried first one and then another of these antennas.

Well, I demonstrated to him what could be done with this antenna and the result is that he wants one of these antennas now.

That is about all I can tell you about it.

As far as the construction of it is concerned that is something I know very little about.

3. Q. Did you find any directional effect in this?

A. No. I live in an apartment house, steel and concrete, and we have steel on the windows and, before, when I was using my set, in order to cut out some of this interference, I would leave my windows open and use considerable insulation around the radio wires.

I have been using this with the windows closed. I notice no difference now that the screens are out and the windows are open or closed, with the arrangement.

In addition I use it for the two sets, on a combination R. C. A. set, and I take a small wire back in the next room and use it in the Wannamaker set which they made for me. I can use the one aerial for the two sets, which, of course, is fine.

4. Q. And do you find any body capacity with the pull.

A. No. I tried that first to turn it around and move it, and I did not notice any difference whatever position it is in.

5. Q. Is that the case with the usual aerial that you have, that you get that body capacity or not?

A. Well, yes.

At first I had a different set with a loop aerial built in.

I bought an R. C. A. and then I changed for a combination machine, a Zenith, and I had to turn that loop to the direction I wanted reception from, even locally. If I did not turn that I would not get a station at all.

I live within a block and a half of the local tower, on top of the hotel, and when that was broadcasting I could not get 1200 or 1400 because that station was all over my dial, and when I got this I had no interference with the other station.

6. Q. You can turn this in any position and get the same reception?

A. You don't have to turn it. I set it back of my set, or on it, or I set it on the top of the tubes or I can put it in the box with a piece of asbestos.

7. Q. You say this aerial is superior or not to any other aerial that you have tried?

A. It is the best that I have ever had.

8. Q. And it has ability to reach stations that you had not thought it possible to reach?

Is that true?

A. Yes. If I tune in on a station and get it it stays there.

9. Q. Do you find anything in connection with static discharge with this?

A. I have very little noise on this, very little on this; I get some once in a while. I have a hair dresser in our building and she uses some sort of Violet Ray, and that is about the only thing I get on my set. I get the buzz when she is using that.

A vacuum cleaner does not bother it, or an electric razor.

10. Q. Is that true with other aerials you have used?

A. No. I had all the noise of the ice box and things like that. I used to have them put condensers on the ice box so that every time it went on and off it did not cut on my program.

11. Q. What about fading?

A. I do not have fading with this.

As a matter of fact, the local station KYW has a philharmonic program that you can listen into and I have been tuning in on the Cleveland station and I can say that the reception of Cleveland is as good as the Philadelphia station.

My father was there last week—my home is in Wheeling, West Virginia, and I showed him the thing for a few minutes and he listened to the two cities. We listened to Wheeling and I have never been able to do that before. I did it before in a frame building but not in a steel building, since I have been married, and he did not believe it until they finally called and gave the local announcement, so I am tickled to death with the reception.

Everyone I have demonstrated it to think I have a selfish interest in it, but I am really sold on the results.

12. Q. You have no interest in this project whatever?

A. No.

Mr. Mason: That is all.

CROSS-EXAMINATION.

By MR. REYNOLDS:

13. XQ. What other kind of antenna have you used outside of this?

A. I had a Philco installed on the roof, one short wave and one long. You turn the coils over one another, and then I had a fifty-foot wire and a sixty-five-foot wire and then a ninety-foot wire and a 145-foot wire and I had them suspended from over the building, and insulated, and had them run down the side of the building; then we dropped a wire with a coil on the end, and then a man came out and hooked up a little heavier bell wire with a coil and I dropped that down two flights out of the window, and that was not satisfactory.

14. XQ. Are those the only kinds that you have tried besides this one?

A. The Philco and the R. C. A. and the Zenith loop, and the Wannamaker set—I don't know the kind that is; I have disconnected that now.

MR. REYNOLDS: I offer in evidence as Exhibit No. 1 copies of the references in this case, a print of the drawings, the Examiner's Statement and the decision of the Board of Appeals.

THE COURT: That will be Defendant's Exhibit No. 1.

(The documents above referred to were thereupon received in evidence and were marked "Defendant's Exhibit No. 1.")

MR. REYNOLDS: As Defendant's Exhibit No. 2 I offer a certified copy of Page 2 of the Office Action of March 30, 1940, and Page 5 of the Amendment filed September 21, 1940, in this application.

I believe that they are included in the complete file.

The Court: They will be accepted as "Defendant's Exhibit No. 2."

(The documents above referred to were thereupon received in evidence and were marked "Defendant's Exhibit No. 2.")

75/33

266453

37

Print of drawing as originally filed.

Fig. 1.

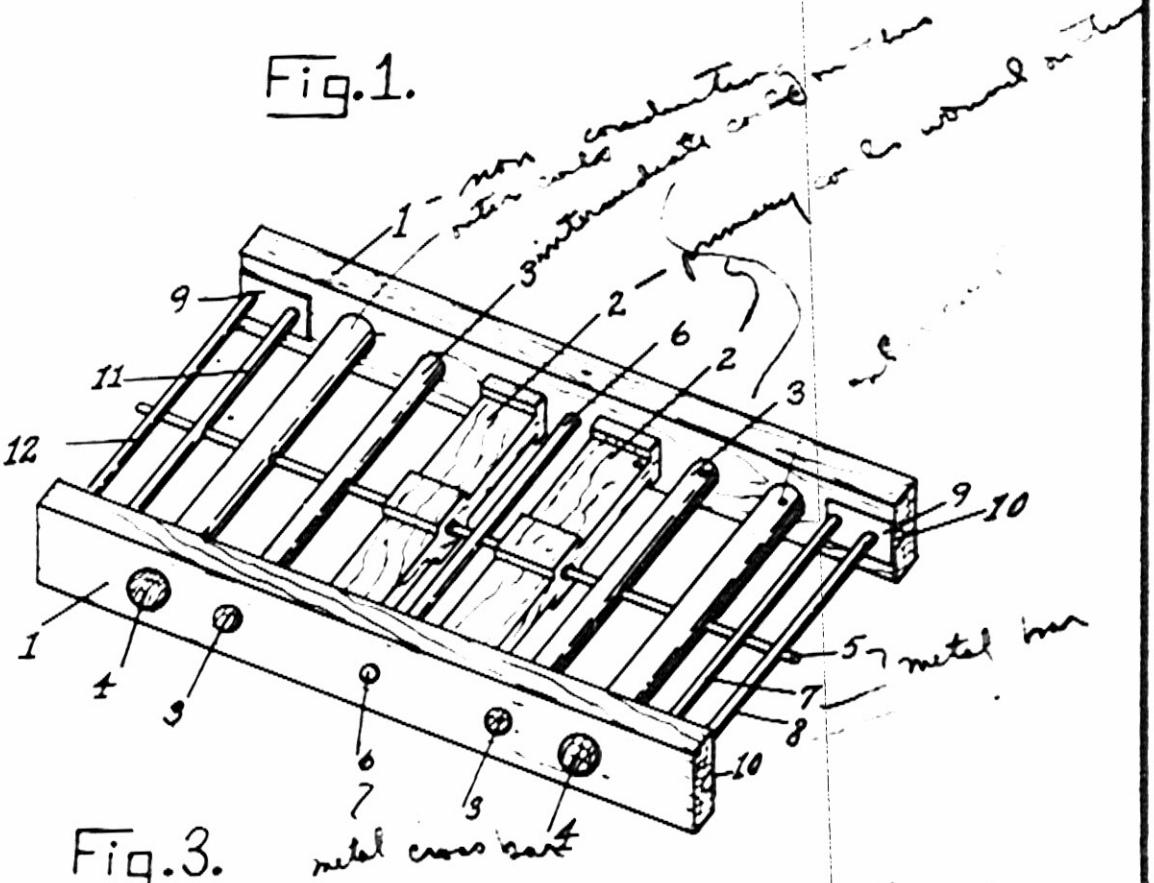


Fig. 3.

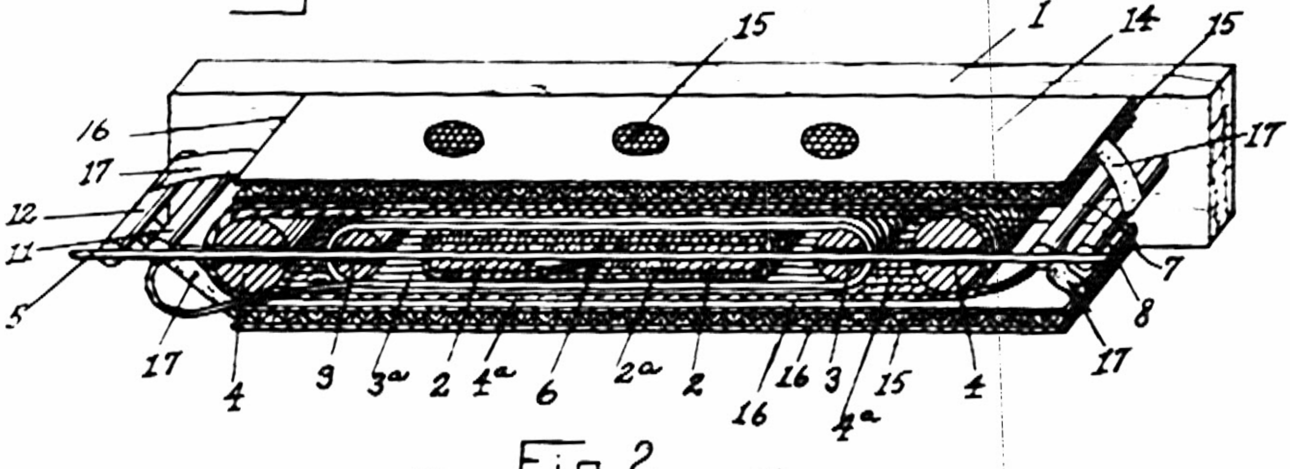
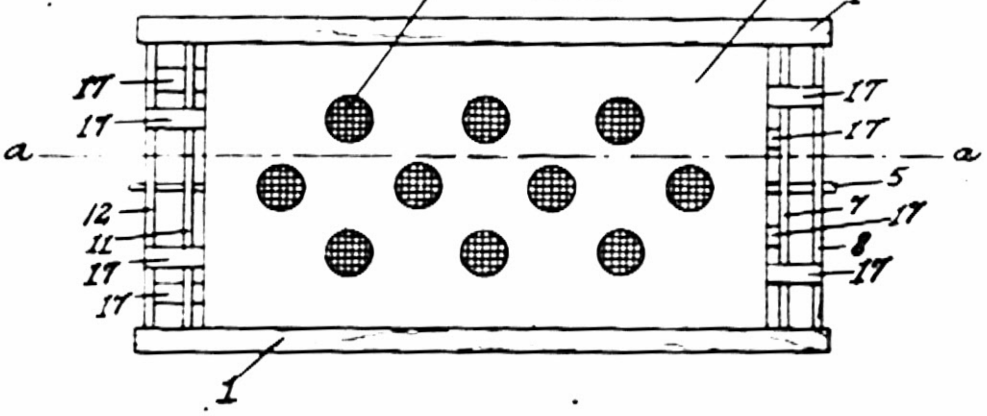


Fig. 2.



INVENTOR

Benjamin Waite Blanchard jr

BY Fred B. Seeberger

ATTORNEY

SPECIFICATION.

To All Whom It May Concern:

Be it known that I, Benjamin Waite Blanchard, Jr., a citizen of the United States, residing at Haddonfield, in the County of Camden and State of New Jersey, have invented a new and useful improvement in a Radio Antenna of which the following is a specification.

This invention relates to portable radio antennas adapted for installation in a receiving set cabinet, or that may be conveniently concealed as may be found desirable.

The object of this invention is to provide a compact portable indoor radio antenna that will not be directional regardless of the position in which it may be found necessary to install same.

Another object of this invention is to provide a portable radio antenna that is compact and of novel construction adapted for all wave reception, and which may, when not placed in a receiving set cabinet, be enclosed by a suitable decorative cabinet or other ornamental device as desired.

Further objects and advantages will be apparent from the following description of the invention as is hereinafter fully disclosed.

In the accompanying drawings;

Figure 1 is a perspective view of the chassis or supporting frame work upon which the several windings of the antenna are mounted,

Fig. 2 is a top plan view of the assembled antenna, and

Fig. 3 is a perspective sectional view of the assembled antenna taken on line a-a in Fig. 2.

The reference characters indicate the same parts in the several drawings.

In the practice of the invention as shown in Figure 1, the body portion of the chassis or wire supporting framework consists of two parallel strips 1 of suitable non-conducting material, the strips 1 being held in spaced relation to each other by the recessed cross bars 2, preparatory to winding the first or primary coil thereon. Fig. 3 shows the respective position of the several wound coils.

The first winding consists of two open end insulated wire coils starting at the side adjacent the strips 1, both coils being of equal length and terminating adjacent the edge of recess near the center of the cross bars 2, said winding is temporarily secured to prevent uncoiling.

The cross bars 3, which are slightly larger in diameter than the outside thickness of the finished coil 2-a are next placed through suitable openings in the frame 1, and second or intermediate pair of open end insulated wire coils 3-a of equal length are wound thereon, the ends of which are temporarily secured to prevent unwinding.

The cross bars 4, which are slightly larger in diameter than the thickness of the finished intermediate coil 3-a are next placed through suitable openings in the supporting frame 1, and a third or outer pair of insulated wire coils 4-a of equal length are wound thereon, the ends of which are temporarily secured to prevent unwinding. Each of the cross bars, 2, 3, and 4, which are of suitable non-conducting material are provided with a small central opening therein to permit passing therethrough a longitudinal metal bar 5. The assembled structure is now paraffined to exclude all moisture therefrom.

A metal cross bar 6 is next placed through a suitable opening in the supporting frame 1, and is intersected by a longitudinal bar 5. A pair of metal bars 7, and 8, which are held in spaced relation by strips of non-conducting material 9, are next placed in the slotted openings 10 in the inner face of the supporting frame 1, and are intersected by the longitudinal bar 5. A similar pair of spaced metal bars 11, and 12, held in spaced relation by strips of non-conducting material 9, are placed in the supporting frame 1 and are intersected by the longitudinal bar 5. All the points of intersection are soldered.

One end of each of the center coils 2-a are connected to the metal cross bar 6 in the center of the supporting frame 1. One end of each of the second or intermediate coils 3-a are connected to the metal cross bar 12, and one end of each of the outer coils 4-a are connected to the metal cross bar 7. All connections are soldered.

An insulated screen or filter 14 which comprises a sheet of metal screen 15, is interposed between two sheets of insulating material 16, and has extending therefrom at each end taps or leads 17 that are integral with the screen material 15 are placed on the opposite sides of the antenna assembly immediately adjacent the outer coils 4-a, and the respective taps or leads from said filter are connected and soldered to the metal cross bars. The upper screen assembly as shown in Fig. 3 has the leads or taps 17 attached to the metal cross bars 8, and 12, while the lower screen or filter assembly taps 17 are attached to the metal cross bars 7 and 12 respectively.

The lead to the antenna post of a receiving set is connected to the center bar 5 and may be attached thereto at either end. The entire antenna assembly may be enclosed in a suitable non-conducting case or ornamental cabinet as preferred.

With respect to the insulated screen or filter, it is not essential to the operativeness of the device that the screen material be interposed between insulated material, a single sheet of insulated material is sufficient. The purpose in using such insulated material is merely a matter of support and any type of support that will prevent intimate contact between the screen material and the adjacent coil winding is entirely satisfactory.

What is claimed as the invention and desired to be secured by Letters Patent is:

2. A radio antenna, comprising a plurality of flattened wire windings of different longitudinal and transverse measurements, nested together with their sides in relatively close parallel relation to one another, a metallic con-

ductor extending through the smallest winding and to which one end of said smallest winding is connected, the other end of said winding being open, second and third metallic conductors outside of the opposite ends of said windings extending substantially parallel with said first conductor, one end of the outside winding and one end of an intermediate winding being connected to said last-mentioned conductors respectively, the opposite ends of said outside and intermediate windings being open, and a longitudinally extending conductor connecting said first, second and third conductors and providing an antenna lead for connection to a radio receiving device.

3. A radio antenna, comprising a plurality of flattened wire windings of different longitudinal and transverse measurements, nested together with their sides in relatively close parallel relation to one another, a metallic conductor extending through the smallest winding and to which one end of said smallest winding is connected, the other end of said winding being open, second and third metallic conductors outside of the opposite ends of said windings extending substantially parallel with said first conductor, one end of the outside winding and one end of an intermediate winding being connected to said last-mentioned conductors respectively, the opposite ends of said outside and intermediate windings being open, a longitudinally extending conductor connecting said first, second and third conductors and providing an antenna lead for connection to a radio receiving set, and wire mesh screens upon the opposite flattened sides of and parallel with the common plane of said windings, the opposite ends of each screen being also connected to said longitudinally extending conductor by leads of different lengths.

4. A radio antenna, comprising duplicate sets of a plurality of flattened windings of different longitudinal and transverse measurements, nested together with their sides in relatively close parallel relation with one another, a

metallic conductor extending through the smallest winding of each set and to which one end of each of the smallest windings is connected, the other end of each smallest winding being open, second and third metallic conductors outside of the opposite ends of said winding sets extending parallel with said first conductor, one end of the outside winding and one end of an intermediate winding of each set being connected to said last-mentioned conductors respectively, the opposite ends of the outside and intermediate windings of each set being open, and a longitudinally extending conductor connecting said first, second and third conductors and providing an antenna lead for connection to a radio receiving set.

5. A radio antenna, comprising duplicate sets of a plurality of flattened windings of different longitudinal and transverse measurements, nested together with their sides in relatively close parallel relation with one another, a metallic conductor extending through the smallest winding of each set and to which one end of each of the smallest winding is connected, the other end of each smallest winding being open, pairs of metallic conductors at the ends of said windings sets extending parallel with said first conductor, one end of each of the outside windings of each set being connected to one of the conductors of each end pair, and one end of each of the intermediate windings of each set being connected to one of the conductors of the other end pair, the opposite ends of said outside and intermediate windings being open, and wire mesh screens upon the opposite flattened sides of and parallel with said windings, one end of each of said screens being connected to one conductor of one end pair and its other end being connected to the opposite conductor of each end pair to provide connecting leads of different lengths, and a conductor extending longitudinally of and between said winding sets to connect said first conductor and said pairs of end conductors together, and provide a lead for connection to a radio receiving device.

6. A radio antenna, comprising a plurality of flattened windings, one within another and having their sides in relatively close parallel relation, a pair of wire mesh screens upon the opposite sides of said windings, one end of each winding being open and the other ends of said windings being connected with spaced portions of said screens to a conductor forming a lead for connection to a radio receiving device.

7. A radio antenna, comprising a plurality of flattened windings, one within another and having their sides in relatively close parallel relation, said windings being of substantially the same lateral extent and comprising substantially the same number of turns, a pair of wire mesh screens upon the opposite sides of said windings, one end of each winding being open and the other ends of said windings being connected with spaced portions of said screens to a conductor forming a lead for connection to a radio receiving device.

AFFIDAVIT OF BENJAMIN WAITE BLANCHARD, JR.

State of New Jersey, }
County of Camden, } *ss.:*

Benjamin Waite Blanchard, Jr., being duly sworn deposes and says, that he is a citizen of the United States, and a resident of Merchantville, in the County of Camden, and State of New Jersey; that he verily believes himself ot be the original, first and sole inventor of the improvements in Radio Antennas described and claimed in the specification filed in and as a part of the above-identified application, Serial No. 266,453, filed April 7, 1939; that he does not know and does not believe that the same was ever known or used before his invention or discovery thereof, or patented or described in any printed publication in any country before his invention or discovery thereof, or more than two years before his application, or in public use or on sale in the United States for more than two years before the date of his application; that said invention has not been patented in any foreign country on an application filed by himself or his legal representatives or assigns more than twelve months prior to his application in the United States, and has not been abandoned;

Deponent further says that in the preparation of a similar affidavit to the foregoing, which was sworn to on September 19, 1940, the number "226,453" was used in the heading and erroneously copied in the body of the said affidavit, instead of the correct serial number 266,453, as above referred to.

Deponent further says that without the aid of advertising, wholesale or retail outlets, and wholly upon the merits of results obtained from said antenna, deponent has sold several hundred of the said antenna to parties in and near Philadelphia, and to other distant points; that all antennas manufactured by said deponent have proven highly satisfactory in all respects and all of the purchasers have expressed their approval and gratification of the utility and exceptional results obtained; that the antennas sold have been used in conjunction with most all types of receivers, from the small Emerson to the specially built Scott, including communications receivers; that Deponent has invested not less than five thousand dollars in the experimental and manufacturing of this antenna. That deponent is now receiving bona-fide orders for antennas and filling them as fast as he can manufacture them; that it has been proved by two years of continued usage that this antenna produces results not obtained on any other type, form or make of antenna now in use or known of; and that its construction is unique and is a great improvement in the art of receiving antennas.

BENJAMIN WAITE BLANCHARD, JR.

Sworn to and subscribed before me, a Notary Public, this 16th day of April, 1941.

ARTHUR H. PAUL,
(Seal) *Notary Public of New Jersey.*

AFFIDAVIT OF B. G. WALTON.

State of Pennsylvania,
County of Philadelphia, } *ss.:*

B. G. Walton, being duly sworn, deposes and says, that he (or she) is of legal age, and resides at 820 Knorr Street, Philadelphia, State of Pennsylvania; that deponent purchased from B. W. Blanchard, Jr., on or about April 1940; a radio antenna, known as the Blanchard All-Wave Indoor Antenna; that since then deponent has continuously used this antenna attached to a ordinary radio (home receiving type). That previous to the purchase and installation of this antenna, the ordinary type of aerial was used. Since the Blanchard antenna was installed, reception results have been more than fifty percent better; that there has been a lessening of static and general noise and no fading. Its compactness, convenience and the elimination of outside wires are matters of special interest. It has conclusively proved its operativeness and utility over any other type of aerial I have used or tried; deponent further says: I am not connected in any way with B. W. Blanchard, Jr., nor interested in the antenna other than as an owner of one of them.

B. G. Walton.

Sworn to and subscribed to before me, a Notary Public, this 29th day of March, 1941.

D. Martin Wolfe,
(Seal) *Notary Public.*
My Commission Expires Aug. 2, 1942.

AFFIDAVIT OF JOSEPHINE POE DUER (MRS. S. NADINE DUER).

State of Pennsylvania, } *ss.:*
County of Philadelphia, }

Josephine Poe Duer (Mrs. S. Nadine Duer), being duly sworn, deposes and says, that he (or she) is of legal age, and resides at Warwick Hotel, Philadelphia, State of Pennsylvania; that deponent purchased from B. W. Blanchard, Jr., on or about August 1940; a radio antenna, known as the Blanchard All-Wave Indoor Antenna; that since then deponent has continuously used this antenna attached to an ordinary radio (home receiving type). That previous to the purchase and installation of this antenna, the ordinary type of aerial was used. Since the Blanchard antenna was installed, reception results have been more than fifty percent better; that there has been a lessening of static and general noise and no fading. It has brought in distant stations that I never had before, and which I was given to understand were impossible to receive in my locality. Its compactness, convenience and the elimination of outside wires are matters of special interest. It has conclusively proved its operativeness and utility over any other type of aerial I have used or tried; deponent further says: I am not connected in any way with B. W. Blanchard, Jr., nor interested in the antenna other than as an owner of one of them.

Josephine Poe Duer.
(Mrs. S. Nadine Duer.)

Sworn to and subscribed to before me, a Notary Public, this 29th day of March, 1941.

Anne C. Heath,
(Seal) *Notary Public.*
My commission expires August 2nd, 1942.

AFFIDAVIT OF ISABEL M. McKEE.

State of Pennsylvania, }
County of Philadelphia, } *ss.:*

Isabel M. McKee, being duly sworn, deposes and says, that he (or she) is of legal age, and resides at 2962 Richmond Street, Philadelphia, State of Pennsylvania; that deponent purchased from B. W. Blanchard, Jr., on or about November 22nd, 1940; a radio antenna, known as the Blanchard All-Wave Indoor Antenna; that since then deponent has continuously used this antenna attached to an ordinary radio (home receiving type). That previous to the purchase and installation of this antenna, the ordinary type of aerial was used. Since the Blanchard antenna was installed, reception results have been more than fifty percent better; that there has been a lessening of static and general noise and no fading. It has brought in distant stations that I never had before, and which I was given to understand were impossible to receive in my locality. Its compactness, convenience and the elimination of outside wires are matters of special interest. It has conclusively proved its operativeness and utility over any other type of aerial I have used or tried; deponent further says: I am not connected in any way with B. W. Blanchard, Jr., nor interested in the antenna other than as an owner of one of them.

Isabel M. McKee.

Sworn to and subscribed to before me, a Notary Public, this 29th day of March, 1941.

Anne C. Heath,
(Seal) *Notary Public.*
My Comm. Expires 8/2/42.

AFFIDAVIT OF NICHOLAS T. HAGALY.

State of Pennsylvania, }
County of Philadelphia, } *ss.:*

Nicholas T. Hagaly, being duly sworn, deposes and says, that he (or she) is of legal age, and resides at 1603 E. Washington Lane, Philadelphia, State of Pennsylvania; that deponent purchased from B. W. Blanchard, Jr., on or about October 1st, 1939; a radio antenna, known as the Blanchard All-Wave Indoor Antenna; that since then deponent has continuously used this antenna attached to an ordinary radio (home receiving type). That previous to the purchase and installation of this antenna, the ordinary type of aerial was used. Since the Blanchard antenna was installed, reception results have been more than fifty percent better; that there has been a lessening of static and general noise and no fading. It has brought in distant stations that I never had before, and which I was given to understand were impossible to receive in my locality. Its compactness, convenience and the elimination of outside wires are matters of special interest. It has conclusively proved its operativeness and utility over any other type of aerial I have used or tried; deponent further says: I am not connected in any way with B. W. Blanchard, Jr., nor interested in the antenna other than as an owner of one of them.

Nicholas T. Hagaly

Sworn to and subscribed before me, a Notary Public, this day of 26th, 1941.

Lillian F. Vogel,
Notary Public.

AFFIDAVIT OF RALPH K. BUSH.

State of New Jersey, } *ss.:*
County of Camden, }

Ralph K. Bush, being duly sworn, deposes and says, that he (or she) is of legal age, and resides at 131 E. Park Avenue, Merchantville, State of New Jersey; that deponent purchased from B. W. Blanchard, Jr., on or about November 1st, 1940; a radio antenna, known as the Blanchard All-Wave Indoor Antenna; that since then deponent has continuously used this antenna attached to an ordinary radio (home receiving type). That previous to the purchase and installation of this antenna, the ordinary type of aerial was used. Since the Blanchard antenna was installed, reception results have been more than fifty percent better; that there has been a lessening of static and general noise and no fading. It has brought in distant stations that I never had before, and which I was given to understand were impossible to receive in my locality. Its compactness, convenience and the elimination of outside wires are matters of special interest. It has conclusively proved its operativeness and utility over any other type of aerial I have used or tried; deponent further says: I am not connected in any way with B. W. Blanchard, Jr., nor interested in the antenna other than as an owner of one of them.

Ralph K. Bush.

Sworn to and subscribed before me, a Notary Public, this 26th day of March, 1941.

William H. Paul,
(Seal) *Notary Public.*
My Commission expires August 5, 1945.

AFFIDAVIT OF M. E. BAKER.

State of New Jersey,
County of Camden, } *ss.:*

M. E. Baker, being duly sworn, deposes and says, that he (or she) is of legal age, and resides at E. Maple Street, Merchantville, State of New Jersey; that deponent purchased from B. W. Blanchard, Jr., on or about October, 1940; a radio antenna, known as the Blanchard All-Wave Indoor Antenna; that since then deponent has continuously used this antenna attached to an ordinary radio (home receiving type). That previous to the purchase and installation of this antenna, the ordinary type of aerial was used. Since the Blanchard antenna was installed, reception results have been more than fifty percent better; that there has been a lessening of static and general noise and no fading. It has brought in distant stations that I never had before, and which I was given to understand were impossible to receive in my locality. Its compactness, convenience and the elimination of outside wires are matters of special interest. It has conclusively proved its operativeness and utility over any other type of aerial I have used or tried; deponent further says: I am not connected in any way with B. W. Blanchard, Jr., nor interested in the antenna other than as an owner of one of them.

M. E. Baker, M. D.

Sworn to and subscribed before me, a Notary Public, this 26th day of March, 1941.

William H. Paul,
(Seal) *Notary Public.*
My Commission expires August 5, 1945.

AFFIDAVIT OF NICHOLAS H. WARRICK.

STATE OF PENNSYLVANIA, }
COUNTY OF PHILADELPHIA, } *ss.:*

Nicholas H. Warrick, being duly sworn, deposes and says, that he (or she) is of legal age, and resides at 2218 Bainbridge Street, Philadelphia, State of Pennsylvania; that deponent purchased from B. W. Blanchard, Jr., on or about September 15, 1940; a radio antenna, known as the Blanchard All-Wave Indoor Antenna; that since then deponent has continuously used this antenna attached to an ordinary radio (home receiving type). That previous to the purchase and installation of this antenna, the ordinary type of aerial was used. Since the Blanchard antenna was installed, reception results have been more than fifty percent better; that there has been a lessening of static and general noise and no fading. It has brought in distant stations that I never had before, and which I was given to understand were impossible to receive in my locality. Its compactness, convenience and the elimination of outside wires are matters of special interest. It has conclusively proved its operativeness and utility over any other type of aerial I have used or tried; deponent further says: I am not connected in any way with B. W. Blanchard, Jr., nor interested in the antenna other than as an owner of one of them.

NICHOLAS H. WARRICK.

SWORN to and subscribed before me, a Notary Public, this 29th day of March, 1941.

ANNE C. HEATH,
(Seal) *Notary Public.*
My commission expires August 2nd, 1941.

AFFIDAVIT OF S. F. HOUSTON.

STATE OF PENNSYLVANIA, } *ss.:*
COUNTY OF PHILADELPHIA, }

S. F. Houston, being duly sworn, deposes and says, that he (or she) is of legal age, and resides at Chestnut Hill, Philadelphia, State of Pennsylvania; that deponent purchased from B. W. Blanchard, Jr., on or about June, 1939; a radio antenna, known as the Blanchard All-Wave Indoor Antenna; that since then deponent has continuously used this antenna attached to an ordinary radio (home receiving type). That previous to the purchase and installation of this antenna, the ordinary type of aerial was used. Since the Blanchard antenna was installed, reception results have been more than fifty percent better; that there has been a lessening of static and general noise and no fading. It has brought in distant stations that I never had before, and which I was given to understand were impossible to receive in my locality. Its compactness, convenience and the elimination of outside wires are matters of special interest. It has conclusively proved its operativeness and utility over any other type of aerial I have used or tried; deponent further says: I am not connected in any way with B. W. Blanchard, Jr., nor interested in the antenna other than as an owner of one of them.

S. F. HOUSTON.

SWORN to and subscribed before me, a Notary Public, this 28th day of March, 1941.

ELEANOR R. RYAN,
(Seal) *Notary Public.*
My Commission Expires August 2, 1942.

AFFIDAVIT OF EDWARD Y. TOWNSEND.

State of Pennsylvania, } *ss.:*
County of Philadelphia, }

Edward Y. Townsend, being duly sworn, deposes and says, that he (or she) is of legal age, and resides at 813 Montgomery Avenue, Bryn Mawr, State of Pennsylvania; that deponent purchased from B. W. Blanchard, Jr., on or about May, 1940; a radio antenna, known as the Blanchard All-Wave Indoor Antenna; that since then deponent has continuously used this antenna attached to an ordinary radio (home receiving type). That previous to the purchase and installation of this antenna, the ordinary type of aerial was used. Since the Blanchard antenna was installed, reception results have been more than fifty percent better; that there has been a lessening of static and general noise and no fading. It has brought in distant stations that I never had before, and which I was given to understand were impossible to receive in my locality. Its compactness, convenience and the elimination of outside wires are matters of special interest. It has conclusively proved its operativeness and utility over any other type of aerial I have used or tried; deponent further says: I am not connected in any way with B. W. Blanchard, Jr., nor interested in the antenna other than as an owner of one of them.

Edward Y. Townsend.

Sworn to and subscribed before me, a Notary Public, this 28th day of March, 1941.

Eleanor R. Ryan,
(Seal) *Notary Public.*
My Commission Expires August 2, 1942.

AFFIDAVIT OF MILDRED BOERICKE.

STATE OF PENNSYLVANIA, } *ss.:*
COUNTY OF PHILADELPHIA, }

Mildred Boericke, being duly sworn, deposes and says, that he (or she) is of legal age, and resides at "Deepdene", Wynnewood, State of Pennsylvania; that deponent purchased from B. W. Blanchard, Jr., on or about August, 1939; a radio antenna, known as the Blanchard All-Wave Indoor Antenna; that since then deponent has continuously used this antenna attached to an ordinary radio (home receiving type). That previous to the purchase and installation of this antenna, the ordinary type of aerial was used. Since the Blanchard antenna was installed, reception results have been more than fifty percent better; that there has been a lessening of static and general noise and no fading. Its compactness, convenience and the elimination of outside wires are matters of special interest. It has conclusively proved its operativeness and utility over any other type of aerial I have used or tried; deponent further says: I am not connected in any way with B. W. Blanchard, Jr., nor interested in the antenna other than as an owner of one of them.

MILDRED BOERICKE.

SWORN to and subscribed before me, a Notary Public, this fourth day of April, 1941.

JOHN J. RUTHERFORD,
(Seal) *Notary Public.*
My Commission Expires January 22, 1943.

AFFIDAVIT OF ROGER W. BARRINGTON.

State of New Jersey, }
County of Camden, } *ss.:*

Roger W. Barrington, being duly sworn, deposes and says that he is a resident of Merchantville, New Jersey, and has had extensive engineering experience, and has specialized in radio transmission and reception; that he is engaged in business under the name of R. W. Barrington Radio Service Company, at #7434 Park Avenue, Merchantville, New Jersey; that deponent spent ten years at sea as a radio operator in the merchant marine, where he used every standard type of receiver, and under all conditions of weather, equipment and technical facilities; that deponent spent three years as technical service engineer with R. C. A. Manufacturing Company, Inc., investigating reception complaints between and including Florida and New York State; that deponent spent three additional years with R. C. A. Manufacturing Company, Inc., in testing transmitters, transmitter designs, and the design of transmitter testing equipment; that deponent spent two additional years with the Farnsworth Television Corporation on high frequency television transmitters; that deponent has subsequently spent more than four years in private practice, responding to complaints and solving problems of faulty radio reception, to the extent of an average of several dozens of such complaints per week;

That deponent is intimately acquainted with the construction and the physical and electrical characteristics of the B. W. Blanchard, Jr., antenna; that deponent has tested said antenna in connection with the equipment of his own station, using standard equipment, said deponent being duly licensed to own and operate an amateur radio sending station, and in addition holds both a first-class Radio-Telegraph and a Radio-Telephone license, under the laws of the United States, and received an award for best amateur station in southern New Jersey for the year 1931; that tests of said antenna were made with receivers, which included a Patterson 10-tube, G. E. Co. 9-tube, Philco 6-tube, Philco 7-tube, Philco 10-tube, and R. C. A. 9-tube; that in every instance the use of said antenna effected a great improvement in signal strength over the widely used loop type antenna, that in most cases there was an increase in strength over that of a normal sixty foot outside aerial, and that in all tests a definite improvement in quality of reception was effected, general fading being reduced and selective fading being eliminated; that deponent's aerial is 135 feet long from the receiver to the far end, the highest point being 65 feet in height; that with the said Blanchard antenna deponent was able to clearly hear stations that he had never before heard, including stations that deponent had previously considered as being impossible to contact, and which were held for hours on end at will;

That deponent demonstrated the use of said antenna on the several receivers to the Chief Operator of Station WCAM, Camden, N. J., and others competent to judge, all of whom expressed surprise at the improvement in signal strength with some receivers and the great increase in clarity of reception and lack of fading with all of said receivers; that in all tests made by deponent there was a definite increase in quality regardless of signal strength, which effect alone proved the utility of said antenna; that deponent considers one case as illustrating the relative merits and utility of said antenna, this case involving a station equipped with a "V" beam (aerial) in which over 800 feet of wire was being used, said aerial then being disconnected and a Blanchard antenna substituted, whereupon there was a drop of 1½ Rs on the receiver's "R" meter, but such an improvement in clarity of reception that two European stations tuned in for test purposes were cleared up entirely, the noise level and fading on the "V" beam (aerial) having been so bad that reception of news reports from said test stations were not clear enough to follow uninterruptedly;

That said antenna at no time, and under no conditions whatsoever evidenced a directional effect or body capacity, so that said antenna could be placed in any available location within a building, without showing any change in signal strength or clarity of reception; that the increased receptivity of all receiving sets was improved for Europe and other distant stations in a manner exactly similar to the improvement noted with respect to nearby stations; that from deponent's training and experience he is convinced that the said Blanchard antenna is the result of a development and not design, thereby making it possible to attain results such as cannot be foreseen or explained by known rules and formulas, and in view of which facts existing terminology cannot be applied to it; and that deponent is not connected by blood or marriage with said B. W. Blanchard, Jr., nor interested in any way in the said antenna, other than as an owner of two of them.

Roger W. Barrington.

Sworn to and subscribed before me, a Notary Public, this 19th day of March, 1941.

Arthur H. Paul,
(Seal) *Notary Public of N. J.*
My Commission Expires March 3, 1946.

AFFIDAVIT OF STEWART A. WOLCOTT, JOSEPH T. MACHETT, CHARLES D. DOWNES, J. ELLSWORTH JONES, ERNEST I. PATAKY.

State of New Jersey,
County of Camden, } *ss.:*

Stewart A. Wolcott, residing at 6755 Irving Avenue, Merchantville, New Jersey; Joseph T. Machett, residing at 3352 Hollywood Circle, Merchantville, New Jersey; Charles D. Downes, residing at 3360 Merchantville Avenue, Merchantville, New Jersey; J. Ellsworth Jones, residing at 6568 Irving Avenue, Merchantville, New Jersey; and Ernest I. Pataky, residing at 4823 West Chestnut Avenue, Merchantville, New Jersey, being duly sworn, depose and say, each one severally and collectively, that they are citizens of the United States of America; that with the exception of Stewart A. Wolcott, they have known Benjamin W. Blanchard, Jr., the applicant named in the above-entitled application for at least one year; that the exception, Stewart A. Wolcott, had never met the applicant prior to April 23, 1941; that none of the above named Deponents has any financial or inventors interest, either direct or indirectly in said application, or in the eventuating Letters Patent, or in the invention covered thereby; that none of the Deponents is an owner of an Antenna covered in the application above referred to; that they are all owners of Radio Receiving Sets, and interested in reception results; that they were invited by the applicant, Benjamin W. Blanchard, Jr., to witness a test; that in accordance with this invitation, the Deponents met at the home of the applicant, 3345 Hollywood Circle, Merchantville, N. J. at approximately 9:30 P. M., April 23rd, 1941, and remained there until approximately 11:30 P. M.; that in Deponents presence the said applicant, Benjamin W. Blanchard, Jr., personally arranged two similar radio receivers, each of them being a Stromberg Carlson, Model 250-L, having eleven tubes; both receivers being placed in the same room, so that the functions would be identical for receiving conditions. The first receiver, being a Stromberg Carlson Model 250-L, and which for the purpose of identification, we will hereinafter designate as Receiver 1. The second receiver being a Stromberg Carlson, Model 250-L, and which for the purpose of identification, we will hereinafter designate as Receiver 2; were both connected to different types of Antennas. Receiver 1 was conncted to a Blanchard All-Wave Indoor Antenna, the same as that referred to in the application known as Serial No. 266,453; that this antenna was removed from its case and left in skeleton form and placed alongside of Receiver 1. Receiver 2 was connected to an RCA, RK-40 Antenna System, installed in accordance with the manufacturers instructions, and that the full 75 feet of lead-in was used. That after the Deponents had inspected the respective Antenna systems, and had thoroughly examined the Radio Receivers, which they found identical in manufacture and model, the test proceeded and the following results noted in the following order in which the test was made:

Band A, 540 to 1640 kilocycles, Broadcast.

Receiver 2.

Strong stations on clear channels within a radius of one hundred miles came in with slight interference. Stations beyond this area were subject to some fade and considerable static.

Receiver 1.

Strong stations on clear channels within a radius of one hundred miles came in with exceptional clarity and volume. No interference, static or fade noted. Stations beyond this area also came in clear and strong without noticeable fade or static. There was at least one-third more stations contacted.

Band B, 1600 to 4800 kilocycles, Short Wave.

Receiver 2.

Amateur, Police, Aviation and Ship calls came in with considerable static and interference. Some were not understandable. There was a very noticeable fade.

Receiver 1.

There was an increase in the number of Amateur, Police, Aviation and Ship calls over Receiver 1, static and interference was reduced. Clarity was improved and fade eliminated.

Band C, 4800 to 11,000 kilocycles, Short Wave.

Receiver 2.

This band produced England in the 49 meter band with the volume full-on. Reception could not be considered as even fair. Italy and Germany came in on the 31 meter band with the volume full-on. There was considerable oscillation, fade and static. Parts of the transmission were not understandable.

Receiver 1.

In the 65 meter band four South American stations, not identified, were produced. In the 49 meter band, Germany, England, several American and South American stations were produced. Between the 49 and 31 meter bands several other stations were produced. In the 31 meter band Mexico, Germany, England, Italy, Colombia, Guatemala, Cuba and several American stations were produced. All of these stations came in with exceptional clariy and volume. England, Germany and Italy were outstanding, being equally as clear and strong as a strong local broadcast station. There was absolutely NO FADE, oscillation and static whenever any of these frequencies were hit. This receiver with the Blanchard Antenna showed a ten to one improvement over Receiver 2 on the same band. The volume control was only turned to about half.

Band D, 11,000 to 22,000 kilocycles, Short Wave.

Receiver 2.

This band did not produce any stations outside of several code stations.

Receiver 1.

In the 25 meter band, Cuba, England, Germany, Italy were produced. On approximately the 22 meter band Ecuador was produced. On the 19 meter band Tokyo, Japan was produced. All of these stations came in with exceptional clarity and volume. No fade, static or oscillation. Every word from Tokyo was understandable.

That the aforesaid Deponents are of the unanimous opinion that Receiver 1 with the Blanchard Antenna vastly surpassed Receiver 2 with the RCA, RK-40 Antenna System. Receiver 1 produced more stations with greater clarity, tone and volume, while Receiver 2 on a lesser number of stations showed considerable oscillation, static and fade. There was an absolute lack of fade on Receiver 1. That the said Deponents made a careful inspection of the Blanchard Antenna attached to Receiver 1, that they thoroughly tested this Antenna for directional effects, which absolutely showed NONE. That body capacity effects were entirely eliminated. That this Antenna was held in the lap of one of the Deponents and placed in all manner of directions, without any directional or body capacity effect. Deponents further state that on Receiver 1 to which the Blanchard Antenna was attached, notice should be given to the ease with which stations were tuned and the complete lack of interference or overlap. That the aforesaid Deponents who entered into and helped to conduct this test, are making this affidavit without monetary compensation or reward, or promises thereof, of any sort whatsoever.

In witness thereof they have individually subscribed their respective sigatures.

STEWART A. WOLCOTT.
Stewart A. Wolcott.
JOSEPH T. MATCHETT.
Joseph T. Matchett. JTM
CHARLES D. DOWNES.
Charles D. Downes.
J. ELLSWORTH JONES.
J. Ellsworth Jones.
ERNEST I. PATAKY.
Ernest I. Pataky.

The name Machett changed to Matchett before signing.

A. W. Paul.

Sworn to and subscribed before me, a Notary Public, this 24th day of April, 1941.

Arthur H. Paul,
Notary Public of New Jersey.

EXAMINER'S STATEMENT.

Applicant is appealing from the final rejection of Claims 2 to 7 inclusive, which constitute all the claims in the application.

The rejected claims read as follows:

> 2. A radio antenna, comprising a plurality of flattened wire windings of different longitudinal and transverse measurements, nested together with their sides in relatively close parallel relation to one another, a metallic conductor extending through the smallest winding and to which one end of said smallest winding is connected, the other end of said winding being open, second and third metallic conductors outside of the opposite ends of said windings extending substantially parallel with said first conductor, one end of the outside winding and one end of an intermediate winding being connected to said last-mentioned conductors respectively, the opposite ends of said outside and intermediate windings being open, and a longitudinally extending conductor connecting said first, second and third conductors and providing an antenna lead for connection to a radio receiving device.
>
> 3. A radio antenna, comprising a plurality of flattened wire windings of different longitudinal and transverse measurements, nested together with their sides in relatively close parallel relation to one another, a metallic conductor extending through the smallest winding and to which one end of said smallest winding is connected, the other end of said winding being open, second and third metallic conductors outside of the opposite ends of said windings extending substantially parallel with said first conductor, one end of the outside winding and one end of an intermediate winding being connected to said last-mentioned conductors respectively, the opposite ends of said outside and intermedi-

ate windings being open, a longitudinally extending conductor connecting first, second and third conductors and providing an antenna lead for connection to a radio receiving set, and wire mesh screens upon the opposite flattened sides of and parallel with the common plane of said windings, the opposite ends of each screen being also connected to said longitudinally extending conductor by leads of different lengths.

4. A radio antenna, comprising duplicate sets of a plurality of flattened windings of different longitudinal and transverse measurements, nested together with their sides in relatively close parallel relation with one another, a metallic conductor extending through the smallest winding of each set and to which one end of each of the smallest windings is connected, the other end of each smallest winding being open, second and third metallic conductors outside of the opposite ends of said winding set extending parallel with said first conductor, one end of the outside winding and one end of an intermediate winding of each set being connected to said last-mentioned conductors respectively, the opposite ends of the outside and intermediate windings of each set being open, and a longitudinally extending conductor connecting said first, second and third conductors and providing an antenna lead for connection to a radio receiving set.

5. A radio antenna, comprising duplicate sets of a plurality of flattened windings of different longitudinal and transverse measurements, nested together with their sides in relatively close parallel relation with one another, a metallic conductor extending through the smallest winding of each set and to which one end of each of the smallest windings is connected, the other end of each smallest winding being open, pairs of metallic conductors at the ends of said windings sets extending parallel with said first conductor, one end of

each of the outside windings of each set being connected to one of the conductors of each end pair, and one end of each of the intermediate windings of each set being connected to one of the conductors of the other end pair, the opposite ends of said outside and intermediate windings being open, and wire mesh screens upon the opposite flattened sides of and parallel with said windings, one end of each of said screens being connected to one conductor of one end pair and its other end being connected to the opposite conductor of each end pair to provide connecting leads of different lengths, and a conductor extending longitudinally of and between said winding sets to connect said first conductor and said pairs of end conductors together, and provide a lead for connection to a radio receiving device.

6. A radio antenna, comprising a plurality of flatened windings, one within another and having their sides in relatively close parallel relation, a pair of wire mesh screens upon the opposite sides of said windings, one end of each winding being open and the other ends of said windings being connected with spaced portions of said screens to a conductor forming a lead for connection to a radio receiving device.

7. A radio antenna, comprising a plurality of flattened windings, one within another and having their sides in relatively close parallel relation, said windings being of substantially the same lateral extent and comprising substantially the same number of turns, a pair of wire mesh screens upon the opposite sides of said windings, one end of each winding being open and the other ends of said windings being connected with spaced portions of said screens to a conductor forming a lead for connection to a radio receiving device.

The references relied on are:

Clark	1,879,978	Sept. 27, 1932	250-33	C. A.
Bodah	1,850,914	Mar. 22, 1932	250-33	C. A.
Jones	1,840,780	Jan. 12, 1932	250-33	C. A.
Speaker	1,828,810	Oct. 27, 1931	250-33	C. A.
Graves	2,039,988	May 5, 1936	250-33	C. A.
Arias	1,820,643	Aug. 25, 1931	250-33	C. A.

The alleged invention as defined by the claims is an aerial consisting of a plurality of flat windings, arranged one within the other, having one end of each of the windings connected to a common terminal, and a conducting screen situated on each flat side of the outer one of said flat windings and also connected to the common terminal.

Specifically the structure as recited by Claims 2 and 4 is five metallic cross bars arranged similarly to steps in a ladder except that the conductors in each outer pair of conductors are closer together than they are from the middle conductor. A sixth metallic bar is arranged at right angles and threads the first five bars. Three flat windings, one within the other, are arranged in the plane of the bars, covering the middle cross bar only. The inner winding is connected to the middle bar. The outer two windings are connected to the outer bars. The significance of this mode of connection is not seen since all the bars are connected together anyway.

Claims 3 and 5 are the same as Claims 2 and 4 except that a pair of wire mesh screens are laid on each side of the outer flat winding and also connected to the six bar network.

Claims 6 and 7 constitute a recitation broadly of the arrangement of windings and screens.

These claims are rejected as unpatentable over Clark, Bodah, Jones, Speaker, Graves and Arias separately and together. The device claimed is not seen to be other than equivalent to any ordinary type of capacity plate or coil antenna. The purpose and function of most of the elements in the elaborate structure recited are not only not apparent, but to assume such a purpose and function requires a revision of many of the accepted facts of electromagnetic phenomena. In the first place, the inner coil is shielded by the middle and outer coil and the two screens. The middle coil is shielded by the outer coil and the two screens. The outer coil is shielded by two screens. All the coils and screens are connected together. It is obvious that the only elements exposed to and responsive to radio waves are the two screens. Further, since the inner opposed surfaces of the two screens are shielded, the only active portions are the outer surfaces. This then shows the whole elaborate structure to be equivalent to a more or less simple sheet of screen wire, such as shown by Arias or a flat winding such as shown by Graves. It should be noticed that the references Graves and Arias are herein applied in the same manner as in the Office Action of March 30, 1940. Specific mention of these references was inadvertently omitted in the final rejection.

The references Bodah, Jones, Clark and Speaker show several forms of coil antennas. Speaker shows a single open ended coil which functions as an electrically elongated, physically condensed antenna. It is not shielded. Clark shows several layers of flat-wound coils used as an antenna. Jones shows a somewhat elaborate winding used as an antenna. Bodah shows several concentrically arranged coils. The references Clark, Bodah, Jones and Speaker are applied as above to show various types of coils used as antennae. It is admitted that none show applicant's structure, though all are similar in purpose and function. The most pertinent references are Graves and Arias who show flat capacitive type antennas which as shown supra in what applicant's structure reduces to. A mere difference in structure in such an antenna, upon which no determined improvement in antenna use or operation is predictable, does not amount to invention to support a patent, nor is it material that other patents may have issued; In re King et al., 570 O. G. 961.

Applicant had been requested to demonstrate this device, in view of the striking results said to be obtained from the use of his antenna. The requested demonstration has been refused and in lieu thereof certain affidavits submitted. A consideration of the same is necessary.

The first affidavit submitted was that of Roger W. Barrington. The affiant appears to be experienced and well qualified for testing radio apparatus. This affidavit states that applicant's antenna showed a great improvement in signal strength over a loop antenna, or a normal 60 foot outside antenna, a definite improvement in quality, general fading reduced and selective fading eliminated. This apparently remarkable action of applicant's device requires a careful scrutiny of the affidavit. First, it is not stated that both applicant's device and the other aerials were applied to receivers in the same duration. That is, that the test aerial be applied, a reading taken, then the conventional aerial applied, a reading taken, then the first aerial again applied, and this repeated several times. As far as the Barrington affidavit is concerned, the tests on the test aerial and the conventional aerials were not necessarily performed on the same day. It is understood in this art that general fading is caused by the signal in the vicinity of the receiver actually changing in strength. No aerial is known which will eliminate this condition, since the condition is independent of the aerial. Therefore, the statement "that general fading is reduced" is believed to be based on an incomplete or otherwise inconclusive tests. Selective fading is that type of fading in which certain of the frequencies in the signal received fluctuate in strength more than other frequencies. This gives rise to the peculiar "rushing" sound of foreign broadcasts. No single receiving aerial so far as is known can have any effect on this phenomena.

The Freeman affidavit states that applicant's antenna practically eliminates atmospheric static, enables the reception of innumerable domestic stations whereas not many were received with a seventy-five foot outside aerial, that the aerial has some effect in noticeably "increasing the strength of any and every station tuned in for a period of five to ten minutes", etc. The Freeman conclusions are remarkable, in that not only is the small indoor aerial vastly superior to the conventional outdoor aerials, but it acts as though "in some way regenerating and then amplifying the current in such a manner as to magnify the intensity of the waves received".

The Wolcott, Matchett, Downes, Jones and Pataky affidavit, likewise to the Barrington and Freeman affidavits, attributes a reduction of static and fading. In fact, this affidavit attributes a total elimination of static and fading to applicant's aerial. For short waves, this affidavit establishes a truly remarkable performance of applicant's aerial as compared to an RCA all-wave antenna. It is to be noted that none of the signers of this affidavit has shown such qualifications as to make him a competent observer. No mention is made that the two receivers used were interchanged during the tests. The results are such as to rather clearly show that the receiver connected to the RCA all-wave aerial was defective.

In view of the above, the following conclusions are made. The statements of the various affiants attribute such extravagant capabilities to applicant's antenna, that either errors were made in the observations, or by some happenstance a truly revolutionary and remarkable aerial has been produced. This Office has asked for a demonstration of the same in order to satisfy itself at first hand, if possible. The device is small and portable. Applicant's reluctance to permit the demonstration is not understood. Accordingly, the conclusion is fairly drawn that the tests forming a basis for each of the affidavits were improperly conducted. Absence of certain essential parts of the tests is noted, such as failure to interchange the two receivers in the affidavit last discussed. Since the superior results attributed to the aerial are questioned, the device cannot be considered to be superior to ordinary capacity antennas in the art, such as those applied supra.

The claims are accordingly thought to be properly finally rejected.

C. D. Backus,
Examiner, Division 51.

DECISION.

BEFORE THE BOARD OF APPEALS.

Ex Parte Benjamin Waite Blanchard, Jr.

Application for Patent filed April 7, 1939,

Serial No. 266,453—Radio Antenna.

Messrs. Mason & Mason for Applicant.

This is an appeal from the decision of the Examiner finally rejecting claims 2 to 7.

The following claim is illustrative:

> 5. A radio antenna, comprising duplicate sets of a plurality of flattened windings of different longitudinal and transverse measurements, nested together with their sides in relatively close parallel relation with one another, a metallic conductor extending through the smallest winding of each set and to which one end of each of the smallest windings is connected, the other end of each smallest winding being open, pairs of metallic conductors at the ends of said windings sets extending parallel with said first conductor, one end of each of the outside windings of each set being connected to one of the conductors of each end pair and one end of each of the intermediate windings of each set being connected to one of the conductors of the other end pair, the opposite ends of said outside and intermediate windings being open, and wire mesh screens upon the opposite flattened sides of and parallel with said windings, one end of each of said screens being connected to one conductor of one end pair and its other end being connected to the opposite conductor of each end paid to provide connecting leads of different lengths, and a conductor extending longitudinally of and between said winding sets to connect said first

conductor and said pairs of end conductors together, and provide a lead for connection to a radio receiving device.

The references relied on are:

Speaker	1,828,910	October 27, 1931
Arias	1,820,643	August 23, 1931
Clark	1,879,978	September 27, 1932
Bodah	1,850,914	March 22, 1932
Jones	1,840,780	January 12, 1932
Graves	2,039,988	May 5, 1936

The claims on appeal are directed to a radio antenna. Applicant's antenna is illustrated and described as a comparatively complex structure. It is believed, however, for the purpose of discussion that the structure may be sufficiently noted from the quoted claim 5. Controversy has arisen between the Examiner and applicant as to the reason for or any new or unobvious result produced by such specific complex structures for an antenna. The situation is presented where the Examiner holds that according to any known electrical actions or principle thereof, it is not apparent why the very specific complex structure of an antenna disclosed by applicant should produce any different results from those of similar coils such as those shown by the citations, except Arias or the capacity effect of the wire gauze of Arias or possibly the association of coils and a capacity area, as associated in the device of Bodah et al.

Applicant has presented numerous affidavits asserting that good results in reception were secured by the use of this antenna. The Examiner has concluded as to these affidavits, however, that they are of a very general nature in regard to statement of results and that there is no showing of comparative results that might be secured by having applicant's antenna tested side-by-side or in rapid succession on the same set and on the same program and scientifically compared by suitable metering devices. The Examiner seems to think that general tests at different times on different programs might get different results due to incidental varying effects such as the fading phenomena, different degrees of static and other causes affecting good performance of antennæ that the affidavits fail to establish any such results as should indicate invention in the antenna.

We have given careful consideration to the record and have reached a conclusion in agreement with that stated by the Examiner. We believe invention in antenna should not be based upon merely differences in arrangement of parts unless it can be shown on one hand that the new arrangement follows some fairly established theory of the principles of radio reception or on the other unless some outstanding results are proven by comparative tests side-by-side between applicant's antenna and those known to the art and by some disinterested, competent party employing testing instruments rather than by general allegations, such as those of record. It may be conceded that these citations do not anticipate the terms of the appealed claims but we are not convinced that this is a sufficient basis for allowance. However, it may be broadly observed that Jones, Bodah and Clark each discloses a plurality of concentric coils which would seem to be equivalent to applicant's concentric coils. Arias discloses the employment of a wire gauze which would seem to correspond to one element of applicant's device and further that Bodah discloses the association of concentric coils with metallic plate members 13-14 which would seem to act as capacitance elements corresponding to applicant's metal plates 14-16. We believe so far as disclosed, the claims present no invention over the state of the art on the ground that applicant's device is, at most, no more than equivalent thereto.

The decision of the Examiner is affirmed.

Examiner-in-Chief.
Examiner-in-Chief.
Examiner-in-Chief.
} Board of Appeals.

Messrs. Mason & Mason,
Munsey Building,
Washington.
February 26, 1943.

Aug. 25, 1931. A. ARIAS **1,820,643**

AERIAL DEVICE

Filed Nov. 3, 1930

Fig. 1.

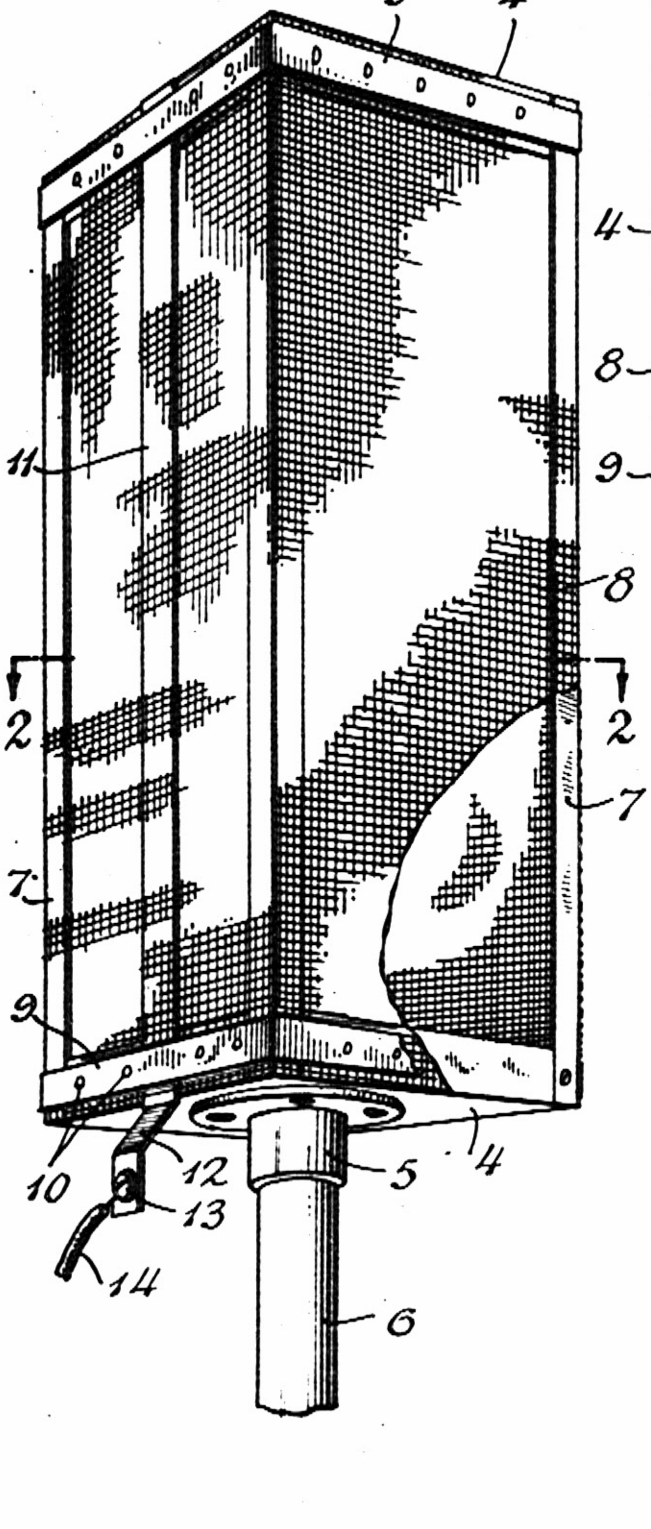


Fig. 2.

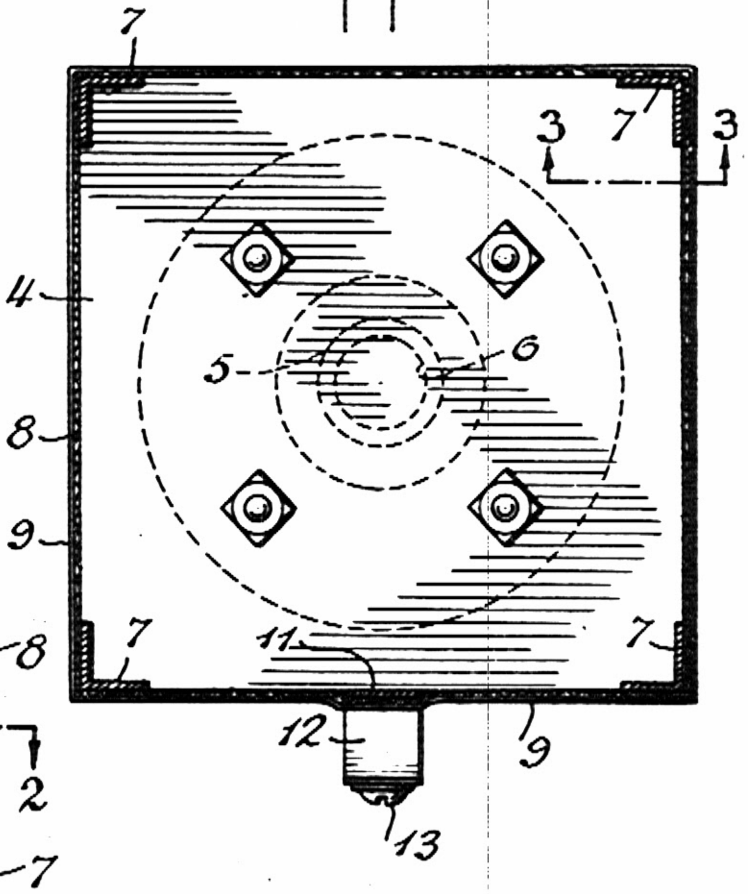
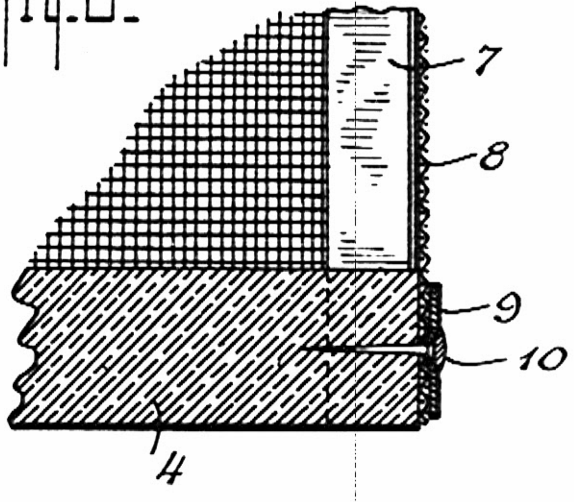


Fig. 3.



INVENTOR.
ARGIMIRO ARIAS
BY Richards & Geier
ATTORNEYS.

UNITED STATES PATENT OFFICE

ARGIMIRO ARIAS, OF BROOKLYN, NEW YORK

AERIAL DEVICE

Application filed November 3, 1930. Serial No. 492,984.

This invention relates to improvements in radio receiving apparatus, and has particular reference to an aerial device.

An object of the invention is to provide an improved aerial of simple and practical construction which will operate to effectively intercept the radio frequency waves.

The above and other objects will appear more clearly from the following detailed description, when taken in connection with the accompanying drawings, which illustrates a preferred embodiment of the inventive idea.

In the drawings—

Figure 1 is a perspective view of the improved aerial constructed in accordance with the invention;

Figure 2 is a section on the line 2—2 of Figure 1; and

Figure 3 is a section on the line 3—3 of Figure 2.

Referring more particularly to the accompanying drawings, the aerial device is shown as a box-like construction comprising the end members 4, one of which has a socket 5 for receiving a standard 6 upon which the device is mounted. The body of the device is completed by connecting the four corners of the end members with the longitudinal connecting bars 7 which are angular in cross-section, said end members and bars being made of insulating material.

The aerial 8 is formed from a single sheet of foraminous material having the required conducting qualities. Said sheet is extended circumferentially around the body of the device and is secured in position thereon by means of straps 9 laid over the ends of the aerial and fixed to the end members 4 by means of fasteners 10. The meeting ends of the aerial are overlapped and secured together by a conducting strip 11 which extends the length of the body of the device and is also affixed to the straps 9. In order to provide for the attachment of a lead-in conductor to the device, the strip 11 has an extension 12 which projects beyond one of the end members 4 and carries a screw 13 by means of which the conductor 14 is attached to the strip.

What is claimed is:

An aerial device comprising a body consisting of end members, longitudinal bars connecting said end members, a sheet of foraminous conducting material surrounding said body between said end members, straps for attaching said material to the end members, and a conducting strip to which the meeting ends of said sheet of material are affixed, said strip extending the length of said body and having an extension projecting beyond one end of the latter for attachment to a lead-in conductor.

In testimony whereof, I have affixed my signature.

ARGIMIRO ARIAS.

Oct. 27, 1931. **J. W. SPEAKER ET AL** **1,828,910**

AERIAL ELIMINATOR

Filed Jan. 25, 1930

Fig. 1.

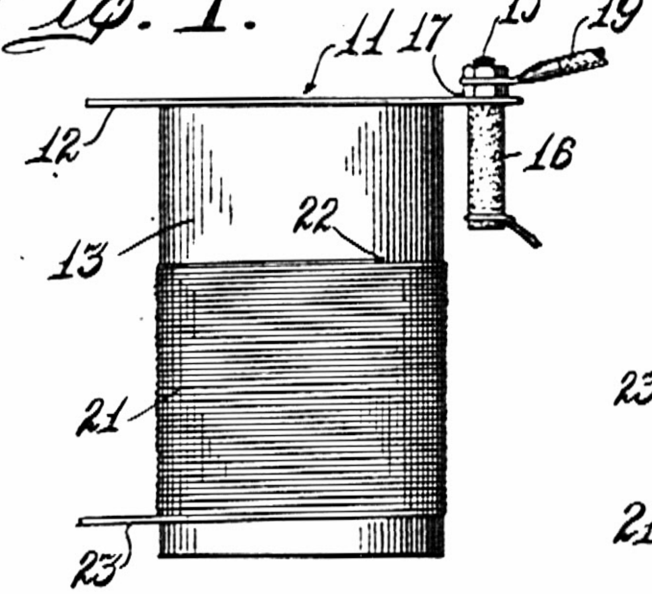


Fig. 2.

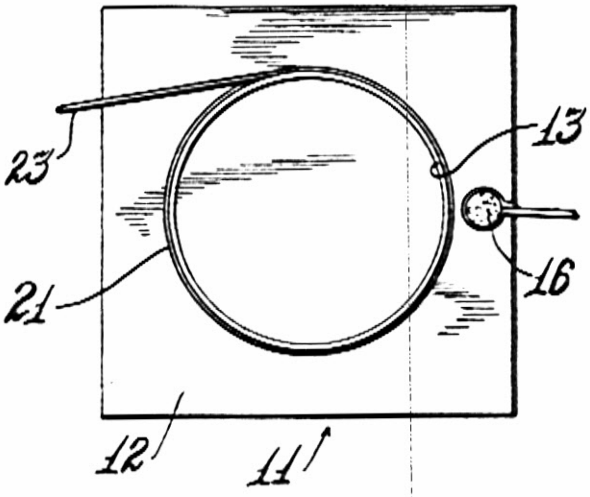


Fig. 3.

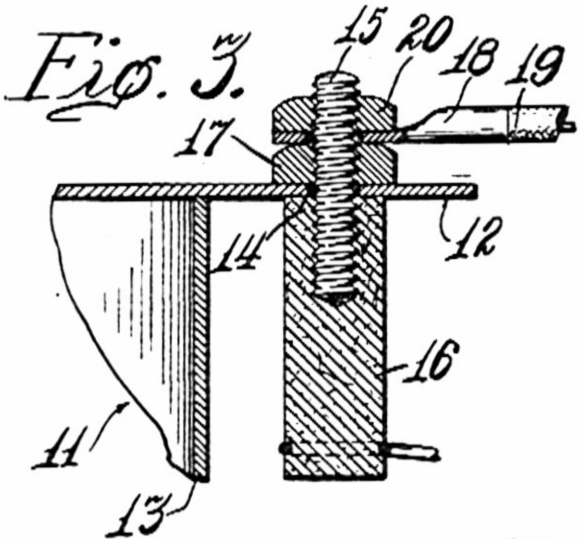
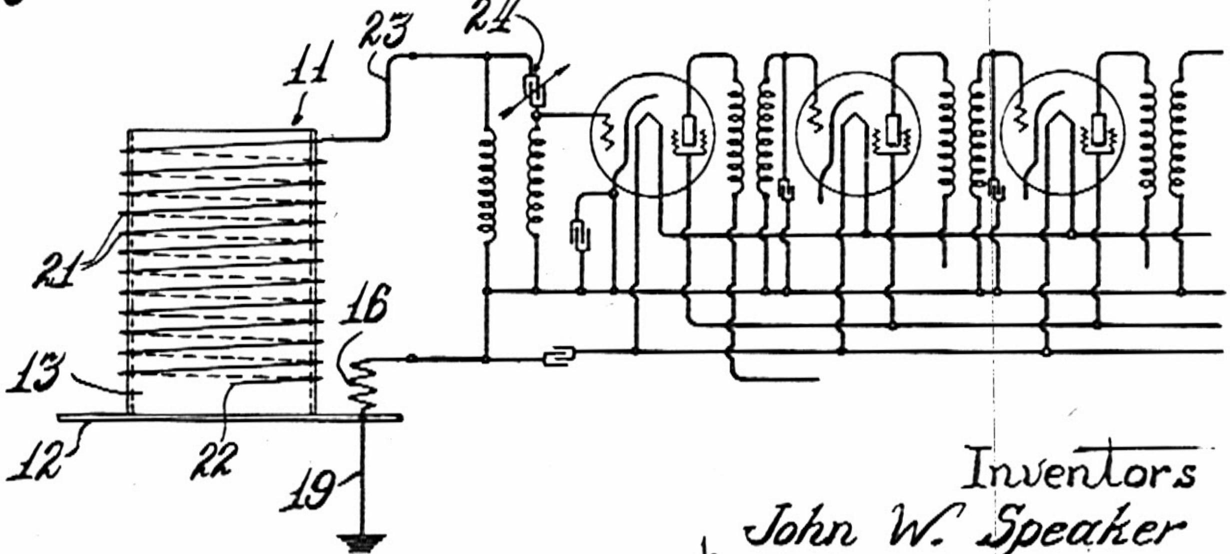


Fig. 4.



Inventors
John W. Speaker
and Anton Selsemeyer

Attorney.

Patented Oct. 27, 1931 1,828,910

UNITED STATES PATENT OFFICE

JOHN W. SPEAKER AND ANTON SELSEMEYER, OF WHITEFISH BAY, WISCONSIN

AERIAL ELIMINATOR

Application filed January 25, 1930. Serial No. 423,370.

The invention in general relates to radio receiving apparatus and more particularly to a method and means for the reduction and elimination of static interference or strays from radio receiving apparatus.

An object of the invention is to provide a device of the character indicated adapted to be conveniently attached to and to form a part of a conventional radio receiving set without change or reorganization thereof.

Another object of the invention is to provide a device of the kind indicated, of simple and inexpensive construction with special adaptation for use in a radio receiving apparatus employing screen-grid vacuum tubes.

The foregoing and such other objects of the invention as will appear hereinafter as the description proceeds, will be more readily understood from a perusal of the following specification, reference being had to the accompanying drawings, in which:

Figure 1 is a side elevational view of an embodiment of the device.

Fig. 2 is an inverted plan view.

Fig. 3 is an enlarged fragmentary vertical sectional view through the device showing the static shunt resistance element in detail.

Fig. 4 is a wiring diagram showing the application of the invention to a conventional type of radio receiving apparatus employing screen-grid vacuum tubes.

In carrying the present invention into practice, advantage is taken of the high amplification factor of the screen-grid vacuum tube which permits the invention to be employed as a unitary device not only for eliminating static interference but also as a satisfactory substitute for an antenna. While no method yet devised has proved adequate for the complete prevention of static interference, the present method and means provides a shunt or path of least resistance to static disturbances taking place as modulated carrier waves are being received in the tuned vacuum tube circuits of the radio receiving apparatus, it being assumed that these tuned vacuum tube circuits have been placed in resonance with the particular station which it is desired to receive. The present circuit shown in Fig. 4, it will be understood, is merely typical of any circuit which may be employed for radio reproduction.

With more particular reference to the drawings, 11 designates the device as a unit which preferably comprises a metal plate 12 with which is integrally formed or conductively attached thereto a metal cylinder 13. The plate 12 is of a size sufficient to provide an overhanging edge beyond the periphery of the cylinder 13, said edge having a hole 14 for accommodating the stud 15 to which is fixedly secured a high resistance element 16 which may be of any suitable material, such as carbon. A nut 17 serves to anchor the stud 15 and consequently the resistance element 16 to the underneath side of the plate 12, while the aperture terminal 18 of a conductor 19 is secured on the stud 15 by a lock nut 20. A winding 21 of insulated wire is arranged in the form of a solenoid on the cylinder 13, one end 22 of the winding 21 being insulatively anchored to the cylinder 13 while the other end 23 is connected to the input of the radio receiving apparatus, as diagrammatically shown in Fig. 4. By inspection of Fig. 4, it is noted that the resistance element 16 is grounded at one end while at its other end a connection is made to the filament ground return of the radio receiving apparatus.

When the customary antenna has been replaced by the device 11, electrical oscillations, received in the inductance or winding 21 which in combination with the metal cylinder 13 serves somewhat as a choke coil, are transmitted through end 23 electrostatically to the radio receiving apparatus, a variable space charge connection being shown in the form of the condenser, 24.

As the details of the radio receiving apparatus, shown by way of example, are conventional, it will suffice to explain the functions taking place in the first vacuum tube circuit thereof. On the assumption that the tuned vacuum tube circuits have been placed in resonance with the broadcast wires of the station to be received, it will be found that electrical oscillations will be efficiently received and that the dimunition in energy suffered by the modulated carrier waves in pass-

BEST COPY AVAILABLE

ing through the radio receiving set, by reason of the high resistance shunt element 16, will not be appreciably noticed. Static interference or strays, however, will find the non-inductive high resistance shunt element 16, in the present case, to offer a path of least resistance to ground, since these strays are assumed to be untuned to the circuits resonated only to the carrier waves desired. The device thus acts in the capacity of a filter circuit for the elimination of static interference while performing the functions of an antenna at the same time.

Although an exemplary form of the invention is shown and described it is to be understood that the device is capable of embodying various changes and modifications without departing from the spirit of the invention or the scope of the appended claim.

We claim:

A device of the character described comprising a metallic plate conductively connected to a metallic core in the form of a cylinder, a winding mounted on said core, a resistance element secured to said plate, said resistance element including a carbon rod extending substantially parallel with said core but spaced therefrom, said plate being conductively connected to said resistance element and having a ground connection, the said winding having an open circuit and an end connected electromagnetically and electrostatically with the input circuit of a radio receiving apparatus.

In testimony whereof we affix our signatures at Milwaukee County, Wisconsin.

JOHN W. SPEAKER.
ANTON SELSEMEYER.

Jan. 12, 1932. **L. L. JONES** **1,840,780**

INDUCTANCE COIL SHIELDING STRUCTURE

Original Filed June 25, 1926 2 Sheets-Sheet 1

Fig. 1.

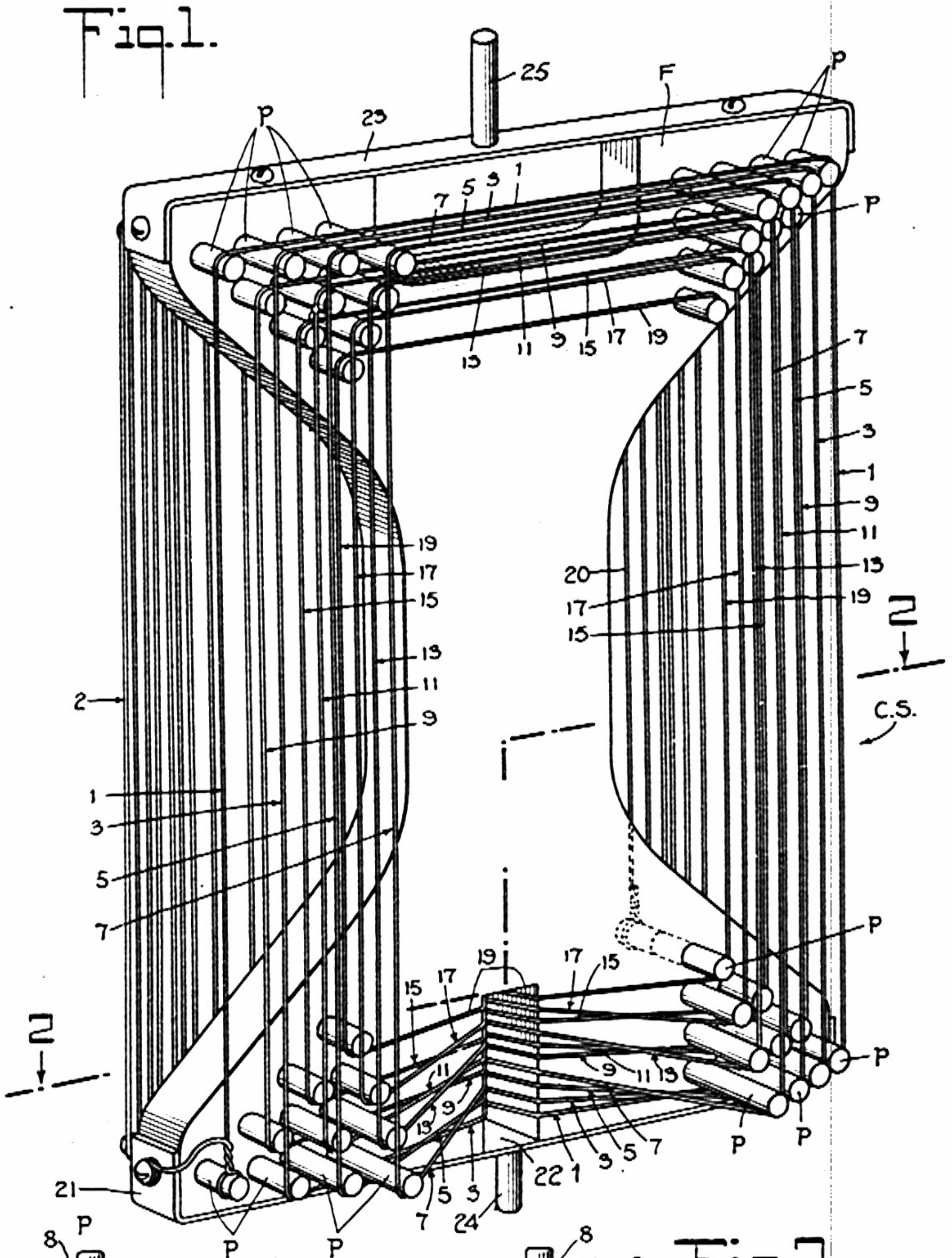
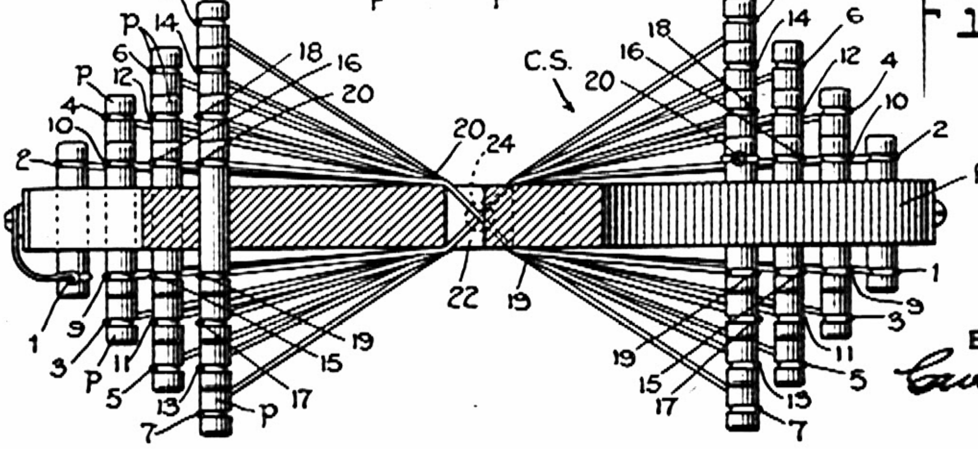


Fig. 2.



INVENTOR
Lester L. Jones
BY
ATTORNEYS

Jan. 12, 1932. L. L. JONES **1,840,780**

INDUCTANCE COIL SHIELDING STRUCTURE

Original Filed June 25, 1926 2 Sheets-Sheet 2

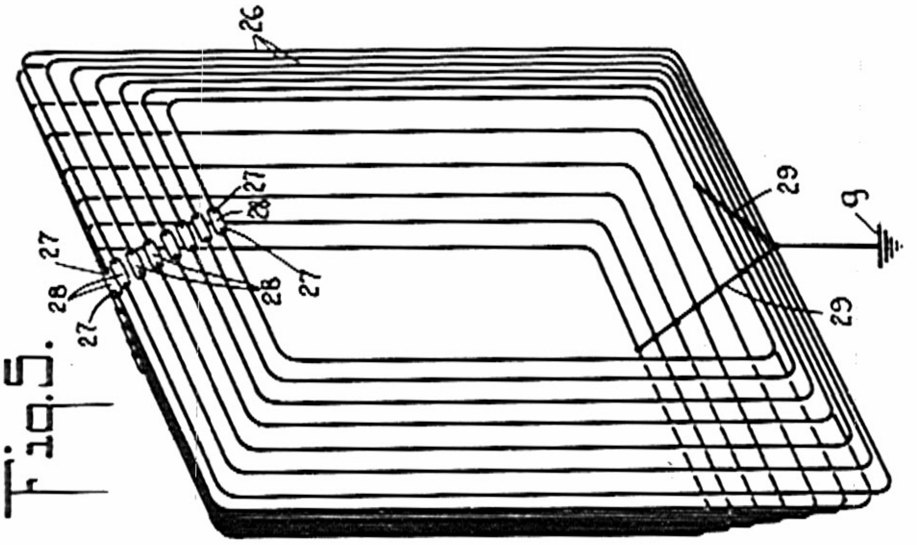


Fig. 5.

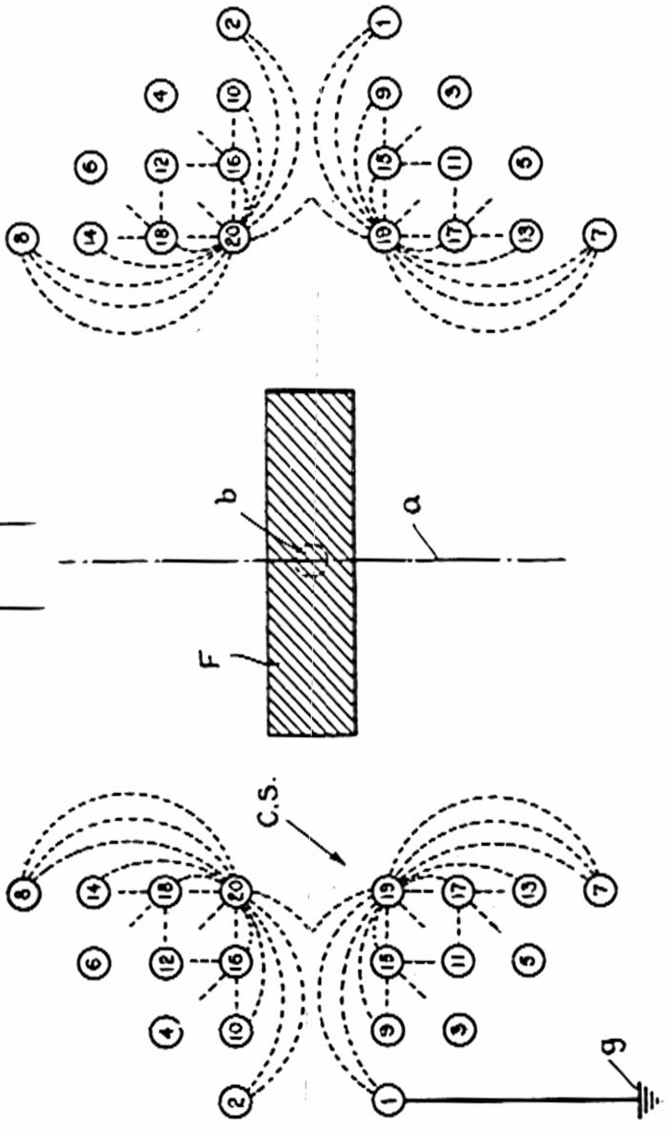


Fig. 3.

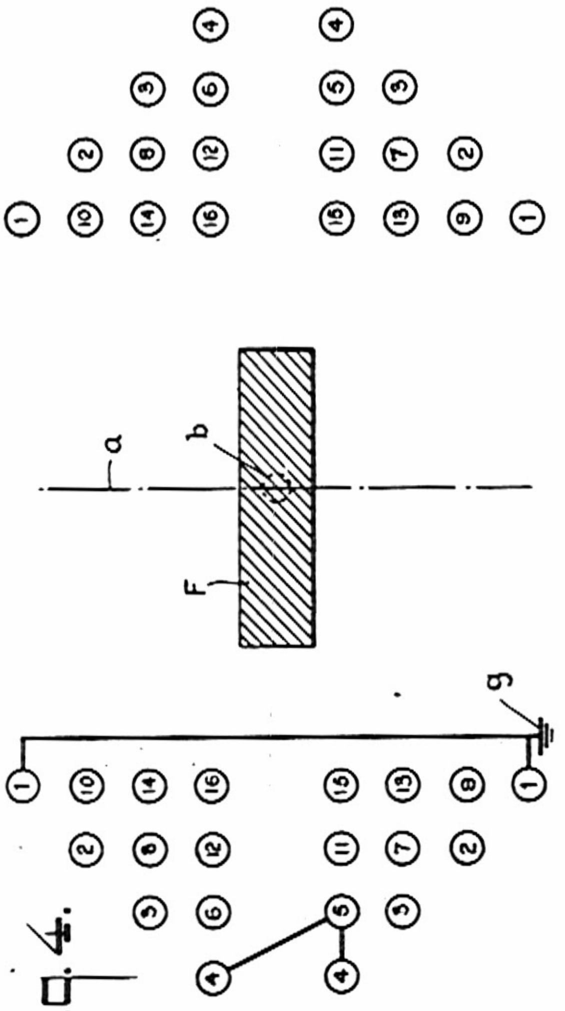


Fig. 4.

INVENTOR
Lester L. Jones
BY
Cavanagh & James
ATTORNEYS

Patented Jan. 12, 1932 **1,840,789**

UNITED STATES PATENT OFFICE

LESTER L. JONES, OF ORADELL, NEW JERSEY

INDUCTANCE COIL SHIELDING STRUCTURE

Application filed June 25, 1926, Serial No. 118,424. Divided and this application filed November 14, 1928. Serial No. 319,336.

This invention relates to an inductance coil and to an electrostatic shielding means therefor, and has special reference to the provision of radio frequency coils especially suitable for use in the reception of radiant energy and commonly known as loop antenna coils; and this application is a division of my co-pending application Ser. No. 118,424, filed June 25, 1926.

The prime desideratum of my present invention comprehends the provision of radio frequency or loop antenna coils constructed so as to be self-electrostatically shielded and designed so that the same may be used with highly sensitive radio frequency amplifying systems and arranged in close proximity to the radio amplifier thereof.

A still further prime object of the invention resides in the provision of a supplementary shield for the inductance coil for effecting a more perfect electrostatic shielding thereof.

Radio frequency coils or loop antennæ of prior construction and design, such for example as the known pancake and helical loop structures, are attended in use with well-known and hitherto insurmountable serious disadvantages. One of the serious objections to these former types of loop antennæ is what is known as antenna effect, this being due to the fact that the loop being commonly connected with one terminal to the grounded filament system and the other terminal to the high potential or grid electrode of the amplifying tube, tends to act as a vertical antenna owing to the exposure of the high potential wires of the loop which normally cover a considerable area. This objectionable antenna effect tends to interfere with the bilateral directivity of the loop and to obscure the sharp minima. Another very serious drawback in these loops of prior design resides in the feed-back reactions which are transferred both magnetically and capacitively from the amplified radio frequency stages to the loop antenna. A loop radio receiving set, in order to be stable and sensitive, must be free from these feed-back reactions; and while the radio frequency stages and the antenna loop may be arranged by known methods to be uncoupled magnetically for all positions of the loop, it has been hitherto found impossible to capacitively decouple the radio frequency coils from the loop except by complete electrostatic shielding of the receiver or the loop.

These objectionable feed-back reactions give rise to other disadvantages, prime among which may be cited the tuning variations of the system as the loop is rotated. The electrostatic shielding which has been hitherto necessitated to avoid the feed-back reactions, together with the capacity effect of the wooden sides of the radio receiver cabinet, together with the capacity effect of the approaching hand or body of the operator to turn the loop, produce variations in the natural frequency of the loop circuit, which variations undesirably change the tuning characteristics of the system, since the loop circuit is normally very sharply tuned. Such variations in the tuning characteristics of the system render it difficult to determine the maxima and minima positions of the loop antenna.

My present invention has for its principal object the provision of a new radio frequency coil or loop antenna embodying a new method of winding the coil whereby the aforementioned disadvantages incident to the use of prior loop structures are effectively obviated, the coil windings being so related that the coil system as a whole is self-capacitively shielded in a manner to overcome the objectionable antenna effect and to minimize the capacitive feed-back reactions between the radio frequency tube and the loop antenna, with the construction moreover such that the loop may be used with highly sensitive radio frequency sets and may be arranged in close proximity to the radio amplifier thereof without necessitating such electrostatic shielding as will produce tuning variations when the loop is rotated.

Further objects of my present invention include the provision of a coil structure in which the turns of the coil are wound so that they are kept tightly stretched in use, producing a mechanically strong loop antenna having a constant inductance; the still further provision of a coil structure of this nature

BEST COPY AVAILABLE

in which the windings are arranged on winding supports so that the forces exerted on the supports by one coil turn operate to increase the tension of and to be balanced by the forces exerted by another turn, producing a mechanically rigid and neat-appearing design.

The electrostatically shielding inductance coils do not produce a complete elimination of all the external electrostatic fields but rather the substantial elimination or the minimizing thereof to the point where no practical difficulties arise. To more completely eliminate external electrostatic fields, it is a further prime object of my invention to provide a supplementary shielding means which is readily applicable to the loop structure of my invention and which does not appreciably increase the distributed capacity of the winding or the volume swept by the loop as would be the case if similar attempts were made with prior loop structures.

To the accomplishment of the foregoing and such other objects as will hereinafter appear, my invention consists in the elements and their relation one to the other as hereinafter more particularly described and sought to be defined in the claims; reference being had to the accompanying drawings, which show the preferred embodiments of my invention, and in which:

Fig. 1 is a perspective view showing a preferred embodiment of the inductance coil embodying the principles of my invention,

Fig. 2 is a cross-sectional view thereof taken in the planes of the broken lines 2—2, Fig. 1,

Fig. 3 is a schematic view considered in cross-section showing the method of winding the coil disclosed in Figs. 1 and 2,

Fig. 4 is a schematic view showing the winding of a modified form of the coil system of my invention, and

Fig. 5 is a perspective view of the supplemental electrostatic shield showing the principles employed therein.

Referring now more in detail to the drawings and having reference first to Figs. 1 and 2 thereof, the inductance coil of my present invention comprises a supporting structure or frame F and a coil system generally designated as C. S. composed of windings supported on the frame, said windings comprising inner and outer connected coil sections or layers arranged so that an outer coil section or layer electrostatically envelops an inner coil section or layer to form an electrostatic shield therefor. In the form of the invention exemplified in the drawings, this multi-layer inductance coil comprises inner, intermediate and outer coil layers, the innermost coil layer being adapted for connection to a point of high potential and the outermost coil layer to a point of low potential, with the arrangement such that each of the coil layers which is exterior to another coil layer is composed of windings which are grouped about the layer within so as to envelop the same whereby each such exteriorly positioned coil layer forms an electrostatic shield for the coil layers within the same.

The arrangement of the coil layers to produce the desired results may be best explained by having reference now to Fig. 3 of the drawings, which figure shows a single series winding composed of 20 turns designated by the reference characters 1 to 20. The turn or winding 1 is connected to a point of low potential such as the ground *g* and the turn or winding 20 is adapted to be connected with a point of high potential such as the grid side of the tuning condenser of the radio receiving set. The windings and turns are, as shown, arranged in alternating relation on opposite sides of and substantially symmetrically with respect to the central plane of the frame F, said central plane being a plane perpendicular to the loop axis *a* and through the axis of rotation *b*. With this series winding it will be seen that the turns 19 and 20 comprise the innermost layer adapted for connection to the point of high potential, the turns 15 to 18 comprise a second layer the turns of which are grouped about the innermost layer, the windings 9 to 14 comprising a third layer the turns of which are grouped about the layers within the same, while the turns 1 to 8 comprise a fourth and outermost layer the turns of which are grouped about the layers within the same.

By means of this construction it will be seen that each of the coil layers which is exterior to another coil layer is composed of windings lying in and bounding a surface the axial dimension of which is greater than that of the corresponding surface of the coil layer within the same and that the said windings of such exterior coil layer are grouped about the layer within so as to envelop the same, whereby each such exteriorly positioned coil layer forms an electrostatic shield for the coil layer or layers within the same. Thus it will be noted that the highest potential turns 19 and 20 are substantially enclosed in the lower potential cage formed by the lower potential wires, the same being true for the succeeding layers which are characterized by progressively lower potential gradients. The turns or windings are arranged to alternate on opposite sides of the coil frame F so as to secure the same average (nearly ground) potential on both sides of the loop to render the residual capacitive coupling substantially invariable as the loop is rotated, such alternation in windings or turns also serving to render the winding operation convenient and facile and producing, moreover, as will be seen hereinafter, a rigid and mechanically strong coil structure.

Referring now again to Figs. 1 and 2 of

the drawings, the method of winding the multi-layer coil system shown in Fig. 3 will now become more apparent. In Figs. 1 and 2 the turns or windings are designated with the same reference characters employed in Fig. 3 of the drawings. The coil frame F, preferably made of insulating material and which may be made of a good non-conductor such as well dried laminated wood, is provided with groups of winding supports in the form of notched dowel pins *p*, *p* which may also be made of wood, which supporting pins are driven through holes drilled in the frame and which project through and on opposite sides of the frame F, the pins being of differing lengths for permitting the spacing of the turns or windings as desired, each pin, however, extending preferably on opposite sides approximately equal distances from the plane of the frame. The method of winding the coil system on the frame may be explained by following the winding course from turn 1 to turn 20, although it will be understood that in the actual winding process the structure is begun by first winding turn 20 and ending with turn 1.

The turn or winding 1 which is connected to the frame support 21 is wound about the four pins *p* at the outermost corners of the frame F, the said turn being then threaded through a slot 22 to the side of the frame F opposite to that on which turn 1 is mounted, the winding being continued as turn 2 on the opposite of said corner pins *p*, *p*. After a complete winding of turn 2 is made, the same is re-threaded through the slot 22 and wound about the next group of pins *p*, *p* lying in the same horizontal planes with the corner pins *p*, *p*. The winding is continued in similar fashion, the wire being threaded through the slot 22 after a turn has been wound so that successive turns of the windings are arranged in alternating relation on opposite sides of and substantially symmetrically with respect to the central plane of the frame, as heretofore stated.

By means of this method of winding, it will be seen that an inner or intermediate layer is surrounded substantially on all sides thereof by an outer or exterior layer, the inner layer being electrostatically shielded substantially over 360° in each plane. It will also be noted that each dowel pin supports two adjacent windings, the winding method being such that the forces exerted on a dowel pin by one coil turn operates to increase the tension of and to be balanced by the forces exerted by the next adjacent turn on the opposite side of the frame. By means of this construction balanced strains are obtained due to winding and there is no loosening of the first windings by distortion of the frame structure due to layer windings such as characterize structures of the prior art. It will be also seen that the pins arranged in diametrical planes are of equal length, while those arranged in vertical or horizontal planes are of successively increasing lengths, this construction permitting the arrangement of the windings desired.

The frame F is mounted to rotate about the axis *b* and to this end the lower frame portion 21 and the upper frame portion 23 are provided with the stub shafts 24 and 25 respectively. The frame may be also cut away at the sides, as clearly shown in Fig. 1 of the drawings, to remove non-essential parts from the internal dielectric field and to make the structure more ornamental.

Referring now to the modification shown in Fig. 4 of the drawings, in which similar parts are designated by reference characters corresponding to those shown with Figs. 1–3, the windings or turns are arranged to secure a lower average potential with respect to the ground of the outer set of wires. To this end the outer layer is wound with two sets of four turns on opposite sides of the frame and designated 1 to 4 respectively, turns 1 on opposite sides of the frame being connected together to form the ground end of the loop while parallel turns 4 are connected together to the beginning of turn 5, as clearly shown in Fig 4 of the drawings. The remaining turns 5 to 16 are wound in alternating relation and in layers similar to that heretofore described. This arrangement gives a considerably lower residual external electrostatic field than that produced by the construction shown in Figs. 1–3 of the drawings, with but slight reduction of the inductance in the loop Moreover, with the construction of Fig. 4 since the outer turns do not cross over through the slot 22 a more perfect electrostatic shield on the slot side of the loop is obtained.

The intensity and direction of the electrostatic fields in the inductance coils embodying the principles of my invention are generally shown in Fig. 3 of the drawings, and by reference to this figure it will be seen that the turns 19 and 20 of the innermost layer are shielded by the succeeding layers, this being indicated by the electrostatic fields of force shown in dotted lines.

The self-electrostatically shielding inductance coils described do not produce a complete elimination of all the external electrostatic fields, but rather the substantial elimination or the minimizing thereof to the point where no practical difficulties arise. To more completely eliminate external electrostatic fields, my invention comprises the addition of a supplementary shielding which is readily applied to the loop structure of my invention and which does not appreciably increase the distributed capacity of the winding or the volume swept by the loop, as would be the case if similar attempts were made with prior loop structures. This supplementary shielding means is perspectively shown in Fig. 5 of the drawings, the said supplementary shield comprising a structure having a configuration such that the same may enclose or surround and be parallel to the loop antenna shown in the preceding figures of the drawings, the loop wires not being shown in Fig. 5 to avoid confusion of the disclosure.

This supplemental shield comprises generically a structure having adjacent open ends and having a ground connection at a point such that the potentials generated at the open ends of the shielding structure due to the E. M. F. induced in the shield by the inductance coil are equal and in opposite phase. In the construction shown in the drawings this point of connection is midway between the open ends of the shielding structure. In the form of the invention exemplified the shield comprises filamentary elements 26, 26, 26 comprising sections of one or more separate wire turns supported on dowel pins similar to the dowel pin supports for the loop wires hereinbefore described. Each shield wire 26 or section is broken so as to provide adjacent open ends 27, 27, which open ends are preferably jointed by an insulating tie such as 28. When a shield of this structure is used in association with the inductance coil or loop, an E. M. F. is induced in the shield wires which raises the potential in the ends of these wires. Shorting of these ends is impractical because of the induced currents in the loop which would be so formed. To reduce the electrostatic field at a distance due to the induced E. M. F. to a minimum, my invention contemplates the joining of the filamentary elements or shield turns as hereinabove specified, which in the form shown in Fig. 5 is at the centers of the filamentary elements for purposes of grounding, this being shown by the junction line 29 connecting the shield filaments at points midway between the open ends thereof, the said junction line being connected to the ground *g*.

The junction point of the shield should be near the place where the loop ends lead off to the tuning condenser, and the ground connection provided should preferably be made to or through the same wire that connects the grounded plate system of the tuning condenser. I have found that this system of grounding is essential where it is desired to have the lowest possible electric field at a distance. This method of ground connection reduces the induced E. M. F. to a minimum and raises the adjacent ends of the filaments to opposite potentials with respect to ground, the result being that at a small distance the potential due to one end of the shield neutralizes that due to the other end of the shield and thus substantially eliminates the electrostatic residual. The effect produced will be better understood when it is seen that the shield turns are threaded by substantially the entire magnetic flux passing through the loop and therefore has induced in each of its turns the same voltage as is induced in each of the outer turns of the loop antenna structure. If, then, for example, the center or mid-point of a single turn section be grounded, then there will exist equal and opposite potentials with respect to ground on the open ends of such turn, which potentials will be approximately one-half the difference of potential across the adjacent outer turns of the loop.

While I prefer to make the ground junction point mid-way between the open ends of the filamentary shielding elements, it will be readily seen that the junction point may be placed at other points of the filamentary elements so long as the resultant effect is to produce the equal and opposite potentials at the open ends of the filaments. Thus the same results may be secured by joining the filamentary elements at one of their ends and running the grounding wire back along the surface of the shielding wires to the bottom mid-point thereof and then away from the loop to the ground. The equivalency of this structure will be seen when it is realized that the potentials produced in the half turn grounding wire are equal to that in the half turns of the shield near which this grounding wire is run, so that the resulting effect is that equal and opposite potentials are generated in the adjacent open ends of the shielding structure.

The manner of making and using my improved inductance coil and shield therefor and the many advantages incident thereto will in the main be fully apparent from the above detailed description thereof. It will be manifest that besides producing an electrostatically shielded antenna coil which eliminates the disadvantageous antenna effect, feed-back reactions and tuning variations characterized by structures of the prior art, I have produced a construction which is subject to ease of winding and economical manufacture embodying low dielectric losses and a maximum leakage path between the turns of the coil system. It will be also manifest that the structure provided is rigid, the windings producing balanced strains on the winding supports resulting in effecting an inductance coil system in which the inductance may be maintained constant in use and effecting an inductance coil which presents a neat appearance.

While I have shown my invention in the preferred forms, it will be apparent that many changes and modifications may be made in the structure disclosed without departing from the spirit of the invention, defined in the following claims.

I claim:

1. The combination with a loop antenna, of an electrostatic shield comprising a loop enclosing structure extending entirely around the periphery of the loop in coaxial relation therewith, said structure having adjacent

open ends and having a ground connection at a point midway between the said open ends.

2. An electrostatic shield for an inductance coil comprising coil enclosing filamentary elements extending entirely around the periphery of the coil in coaxial relation therewith, the said elements having open ends and having a ground connecton midway between the said open ends.

3. An electrostatic shield for an inductance coil comprising wire turns adapted to enclose the inductance coil, each turn having open ends joined by an insulating tie, the said turns being joined together at points midway between the open ends thereof to form a ground connecting junction.

4. In combination with an inductance coil, of an electrostatic shield comprising a coil enclosing structure having open ends and means for grounding said shield structure at a region therein such that the potentials generated at the open ends of the shielding structure due to the voltage induced therein by the inductance coil are in opposite phase.

5. In combination with an inductance coil, of an electrostatic shield comprising coil enclosing filamentary elements, the said elements having open ends, the said filamentary elements being joined together in a region for connection to ground such that the potentials generated at the open ends of the filamentary elements due to the voltage induced therein by the inductance coil are in opposite phase.

6. In combination, a multi-layer inductance coil comprising inner and outer connected coil sections, the inner coil section being adapted for connection to a point of high potential and the outer coil section to a point of low potential, the outer coil section comprising a winding layer lying in and bounding a surface the axial dimension of which is greater than that of the corresponding inner coil section surface and the said windings of the outer coil section being grouped about the inner coil section so as to envelop the same whereby the outer coil section forms an electrostatic shield for the inner coil section, and an electrostatic shield for said inductance coil comprising a coil enclosing structure having open ends and means for grounding said shield structure at a region therein such that the potentials generated at the open ends of the shield structure due to the voltage induced therein by the inductance coil are in opposite phase.

7. In combination, a multi-layer inductance coil comprising a series of connected coil sections forming inner, intermediate and outer coil layers, the innermost coil layer being adapted for connection to a point of high potential and the outermost coil layer to a point of low potential, each of the coil layers exterior to another coil layer comprising windings lying in and bounding a surface the axial dimension of which is greater than that of the corresponding surface of the coil layer within the same, and the said windings of such exterior coil layer being grouped about the layer within so as to envelop the same whereby each such exteriorly positioned coil layer forms an electrostatic shield for the coil layers within the same, and an electrostatic shield for said inductance coil comprising a coil enclosing structure having open ends and means for grounding said shield structure at a region therein such that the potentials generated at the open ends of the shielding structure due to the voltage induced therein by the inductance coil are equal and in opposite phase.

8. In combination, a multi-layer inductance coil comprising a coil frame and a plurality of winding layers thereon, the windings of the layers being arranged in alternating relation on opposite sides of the plane of said frame, said windings forming two multi-layer groups, one multi-layer group lying wholly on one side and the other multi-layer group lying wholly on the other side of said plane; and an electrostatic shield for said inductance coil comprising a coil enclosing structure having open ends and means for grounding said shield structure at a region therein such that the potentials generated at the open ends of the shielding structure due to the voltage induced therein by the inductance coil are in opposite phase.

9. In combination, a multi-layer inductance coil comprising a coil frame and windings thereon, successive turns of the windings being arranged in alternating relation on opposite sides of a central plane of said frame, said alternating turns forming two multi-layer groups, one multi-layer group lying wholly on one side and the other multi-layer group lying wholly on the other side of said plane, and both multi-layer groups being arranged substantially symmetrically with respect to the central plane of said frame; and an electrostatic shield for said inductance coil comprising a coil enclosing structure having open ends and means for grounding said shield structure at a region therein such that the potentials generated at the open ends of the shielding structure due to the voltage induced therein by the inductance coil are in opposite phase.

10. In combination, a multi-layer inductance coil comprising a series of connected coil sections forming inner, intermediate and outer coil layers, the innermost coil layer being adapted for connection to a point of high potential and the outermost coil layer to a point of low potential, each of the coil layers exterior to another coil layer comprising windings grouped about the windings of the layer within so as to substantially completely envelop the same whereby each such exteri-

BEST COPY AVAILABLE

orly positioned coil layer forms an electrostatic shield for the coil layers within the same; and an electrostatic shield for said inductance coil comprising coil enclosing filamentary elements, the said elements having open ends, the said filamentary elements being joined together in a region for connection to ground such that the potentials generated at the open ends of the filamentary elements due to the voltage induced therein by the inductance coil are in opposite phase.

11. An electrostatic shield for a loop antenna coil comprising wire turns arranged coaxially with the antenna turns and adapted to entirely enclose the antenna coil, each of said turns having open ends in order to open circuit the same.

12. In combination with a loop antenna coil, an electrostatic shield comprising a coil enclosing structure comprising wire turns having open ends and means for grounding the turns of said shield structure and the outer turn of said antenna coil.

Signed at New York in the county of New York and State of New York this 10th day of November, A. D. 1928.

LESTER L. JONES.

March 22, 1932. F. J. BODOH ET AL 1,850,914

RADIO AERIAL

Filed May 2, 1928

Fig. 1.

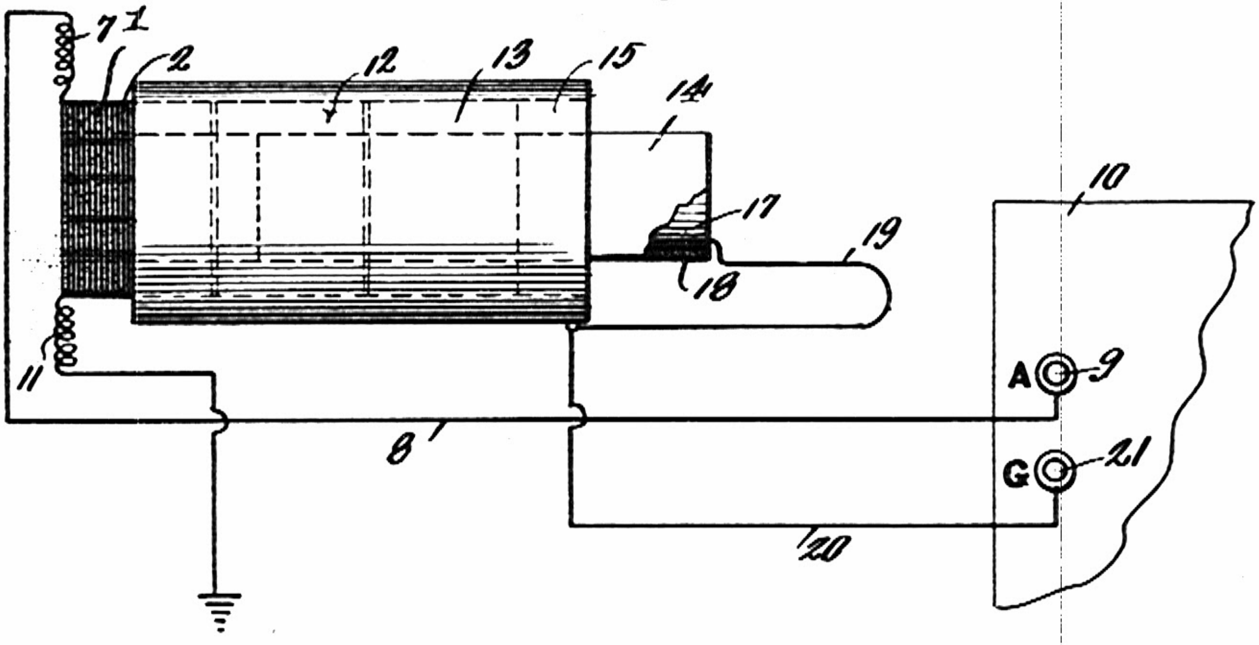


Fig. 2.

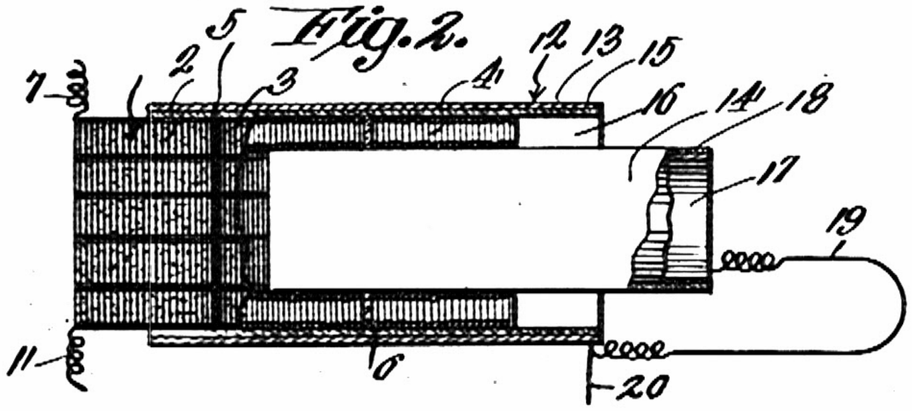


Fig. 3.

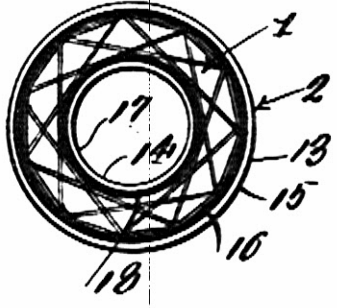


Fig. 4.

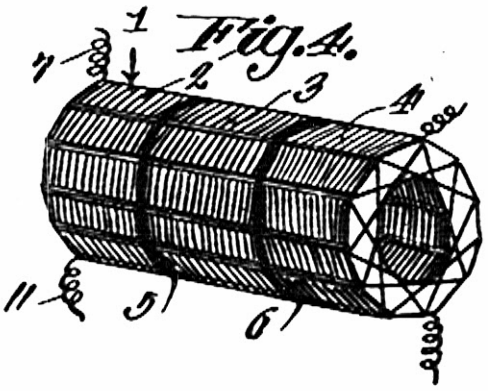
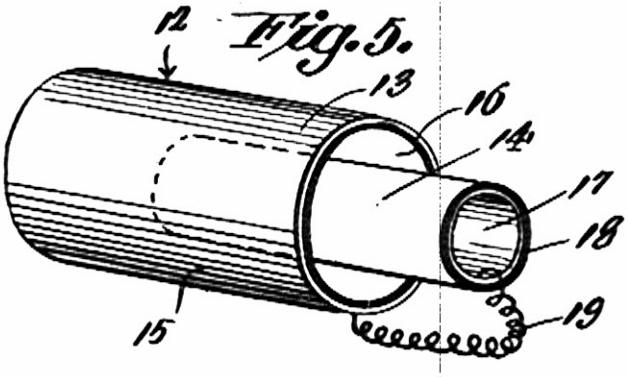


Fig. 5.



WITNESSES

Guy M. Spring

T. G. Smith

INVENTORS

FRANK J. BODOH
AUSTIN O. SARFF
BY
Irving L. McCathran
ATTORNEY

BEST COPY AVAILABLE

Patented Mar. 22, 1932 **1,850,914**

UNITED STATES PATENT OFFICE

FRANK J. BODOH AND AUSTIN O. SARFF, OF WALKER, MINNESOTA, ASSIGNORS OF ONE-THIRD TO ADMIRAL ROSS BAILEY, OF WALKER, MINNESOTA

RADIO AERIAL

Application filed May 2, 1928. Serial No. 274,640.

This invention relates to improvements in radio aerials and more particularly to an aerial designed primarily for indoor use and especially in connection with electrified receiving sets of those types employing alternating current and battery eliminators and which aerial will take the place of and present marked advantages over outdoor aerials of the usual types.

One of the objects of the present invention is to provide an indoor aerial by the use of which increased volume may be obtained and the annoying effects of static and other interference may be overcome, the invention also contemplating an aerial whereby stations may be more readily and perfectly separated than is possible where ordinary aerials are employed.

While the accompanying drawings and the description which is to follow, constitutes a disclosure of the preferred embodiment of the invention, it will be understood that various changes may be made within the scope of what is claimed.

In the accompanying drawings:

Figure 1 is a view in elevation of the aerial embodying the invention, the view illustrating diagrammatically the manner in which the aerial is coupled with a receiving set;

Figure 2 is a view partly in longitudinal section and partly in elevation illustrating the aerial;

Figure 3 is a view in end elevation of the aerial;

Figure 4 is a perspective view of the coil unit of the aerial;

Figure 5 is a perspective view of the adjustable inductance-varying unit of the aerial separated from the coil unit.

The coil unit of the antenna is indicated in general by the numeral 1 and the same preferably comprises a set of three coils, indicated one by the numeral 2, another by the numeral 3, and the third by the numeral 4, these coils being disposed in axial alinement and the coils 2 and 3 being separated by an insulating ring 5 and the coils 3 and 4 being similarly separated by an insulating ring 6, the coils being wired in series. As illustrated in Figure 1 of the drawings, the primary terminal of the coil 2 of the series is provided with a tap 7 adapting it for the connection thereto of a wire 8 leading to the aerial binding post 9 of a radio receiving set 10, the secondary of the first coil 2 being provided with a similar tap 11 for connection with a suitable ground, it being understood, as before stated, that the coils are connected with one another, in series. As the coils 2, 3 and 4 are connected in series, the primaries of the coils and the secondaries will of course be mutually connected in the order in which the coils are arranged and the terminals of the primary and secondary of the coil 4 at the end of the coil opposite the end which is associated with the coil 3 are non-connected and are suitably arranged to avoid contact with any part of the aerial or any adjacent object.

The coils comprising the coil unit 1 are illustrated as of the honey comb type, but the coils may be otherwise wound, and it is preferable that they be of .00035 mfd. capacity.

In connection with the coil unit 1, the invention contemplates the utilization of an inductance-varying unit which is indicated in general by the numeral 12 and which comprises two inductance-varying elements, one indicated by the numeral 13 and the other by the numeral 14. The inductance-varying element 13 comprises a cylindrical body 15 of any suitable metal which is of a length equal substantially to the length of the coil unit 1 and which is of an internal diameter slightly greater than the external diameter of the coil unit and provided with a lining 16 of insulating material, this element of the inductance-varying unit being slidably adjustably fitted onto the coil unit 1 as clearly shown in Figures 1, 2 and 3 of the drawings. The element 14 of the inductance-varying unit likewise comprises a hollow cylindrical body 17 which corresponds to the body 15 of the element 13 and which is of any metal suitable for the purpose and exteriorly of a diameter slightly less than the internal diameter of the coil unit 1, a coating 18 of insulating material being provided upon the outer surface of the said element 17 and the element being slidably fitted into the coil unit 1 as shown in Figures 2 and 3 of the drawings. A flexible conductor wire 19 is connected at one end, as clearly shown in Figures 1, 2 and 5 of the drawings, to the body 15 of the element 13 and at its other end is connected to the corresponding end of the body 17 of the element 14. The element 14, like the element 13, is preferably of a length equal substantially to the length of the coil unit 1 and the wire 19 is of a length to permit of complete freedom of adjustment of the two elements 13 and 14 of the inductance-varying unit with respect to each other and likewise with respect to the coil unit 1. A conductor wire 20 is connected at one end to the body 15 of the element 13 of the inductance-varying unit 12, preferably at the point of connection of the wire 19 therewith and is adapted to be connected to the ground binding post 21 of the receiving set 10.

While the elements 13 and 14 of the inductance-varying unit 12 have their bodies 15 and 17, respectively, illustrated as formed of metal and of cylindrical form, it will be readily understood that these elements may assume some form other than the form illustrated and that they may be constructed otherwise than of the true cylindrical and imperforate form shown in the drawings, the invention residing broadly in the provision, in combination with the coil unit, of an inductance-varying unit adjustably assembled therewith, together with the necessary conductors to complete the aerial circuit.

The aerial embodying the invention may be supported and connected with the receiving set, in connection with which it is to be employed, in any desired manner and likewise any suitable means may be employed for adjusting the inductance-varying unit elements, it being understood that these elements are intended to be selectively and independently adjustable.

Having thus described the invention, what we claim is:

1. A radio aerial comprising a coil including primary and secondary windings having terminals for connection respectively with the intake of a receiving apparatus and with ground, and an inductance-varying unit comprising elements of electro-conductive material one slidable longitudinally within and the other exteriorly of the coil, all of said elements being of substantially the same length, insulating layers upon said elements at their surfaces which oppose the coil, all of said elements and coils adapted to be arranged in complete nested relation, a flexible conductor electrically connecting the said elements, the said elements being adjustable, and a conductor leading from one of said elements for connection with the ground terminal of a receiving apparatus.

2. A radio aerial comprising a coil unit including a series of coils arranged in longitudinal alinement, an insulating ring separating the series of coils, the coils being in series with one another and including primary and secondary windings, the primary and secondary winding of one end of one of the coils of the series having terminals for connection respectively with the intake of a receiving apparatus and with ground, and an inductance-varying unit in circuit with the field of the coil and comprising elements adjustable independently of each other and with respect to the coil, the elements being of substantially the same length as the series of coils and capable of being arranged in nested relation with respect thereto, one of said elements being adjustable within the coil and provided with an outer insulating cover and slightly spaced from the coil and the other exteriorly thereof, the latter element provided with an insulating lining slightly spaced from said coil, a conductor connecting the said elements and flexible to permit of relative adjustment of the elements, and a conductor leading from one of the elements for connection with the ground terminal of the receiving apparatus.

In testimony whereof we affix our signatures.

FRANK J. BODOH.
AUSTIN O. SARFF.

Sept. 27, 1932. **J. A. CLARK** **1,879,978**

RADIOANTENNA DEVICE

Filed Nov. 28, 1930 3 Sheets-Sheet 1

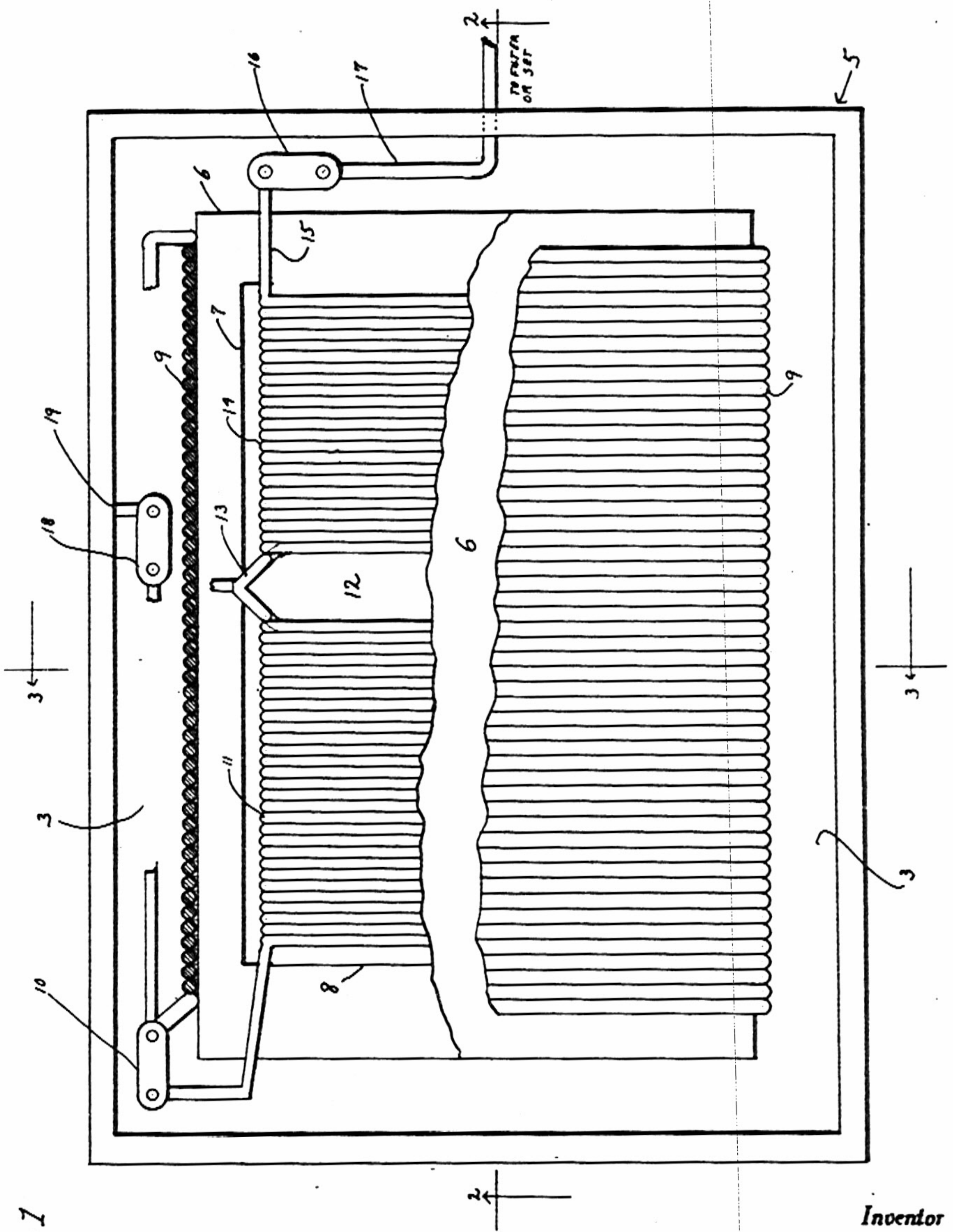


Fig 1

Inventor

James A. Clark

By Clarence A. O'Brien

Attorney

Sept. 27, 1932.

J. A. CLARK

RADIOANTENNA DEVICE

Filed Nov. 28, 1930

1,879,978

3 Sheets-Sheet 2

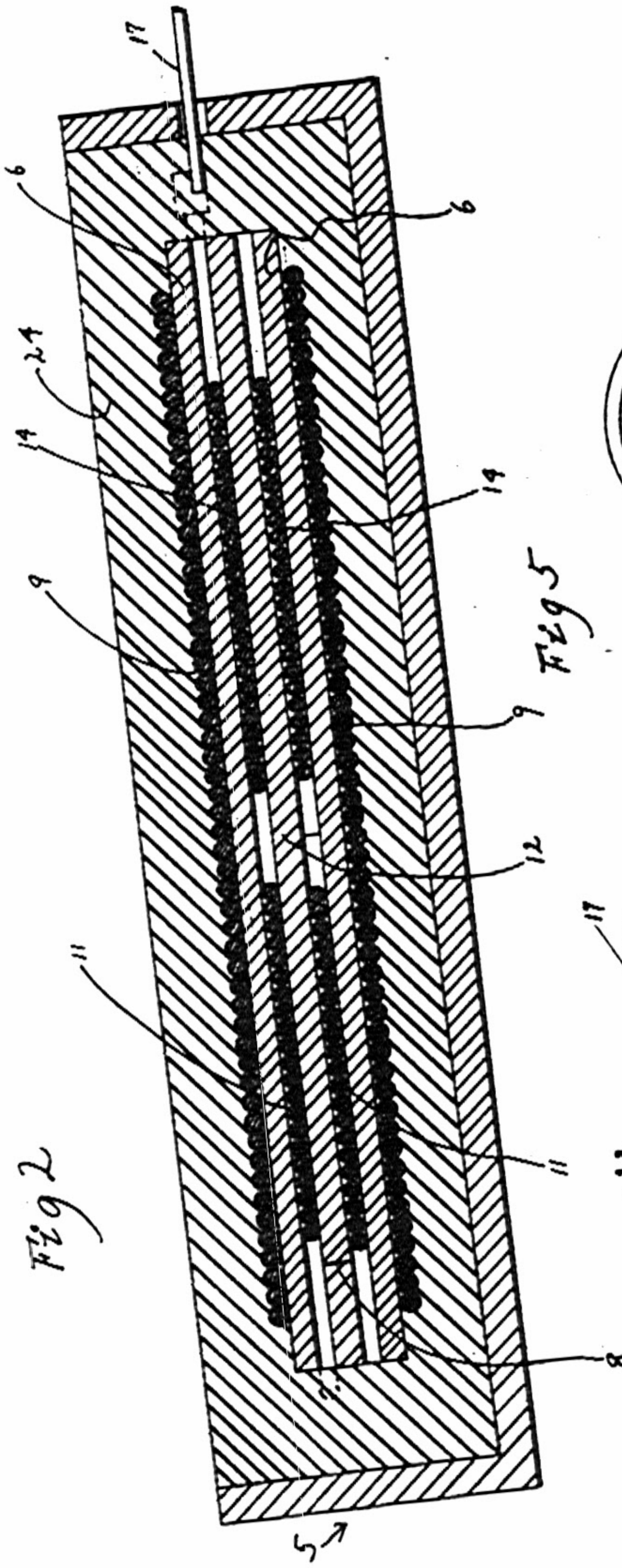


Fig 2

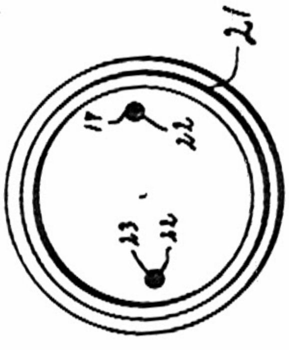


Fig 5

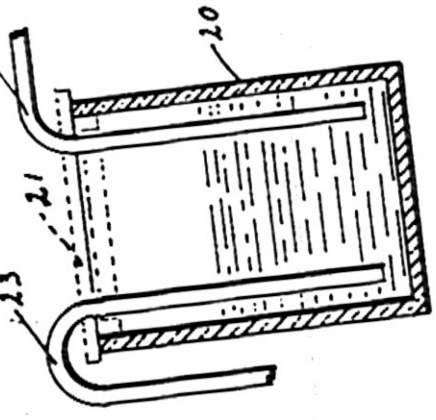


Fig 4

Inventor

James A. Clark

By Clarence A. O'Brien Attorney

Sept. 27, 1932. J. A. CLARK 1,879,978

RADIOANTENNA DEVICE

Filed Nov. 28, 1930 3 Sheets-Sheet 3

Fig 6

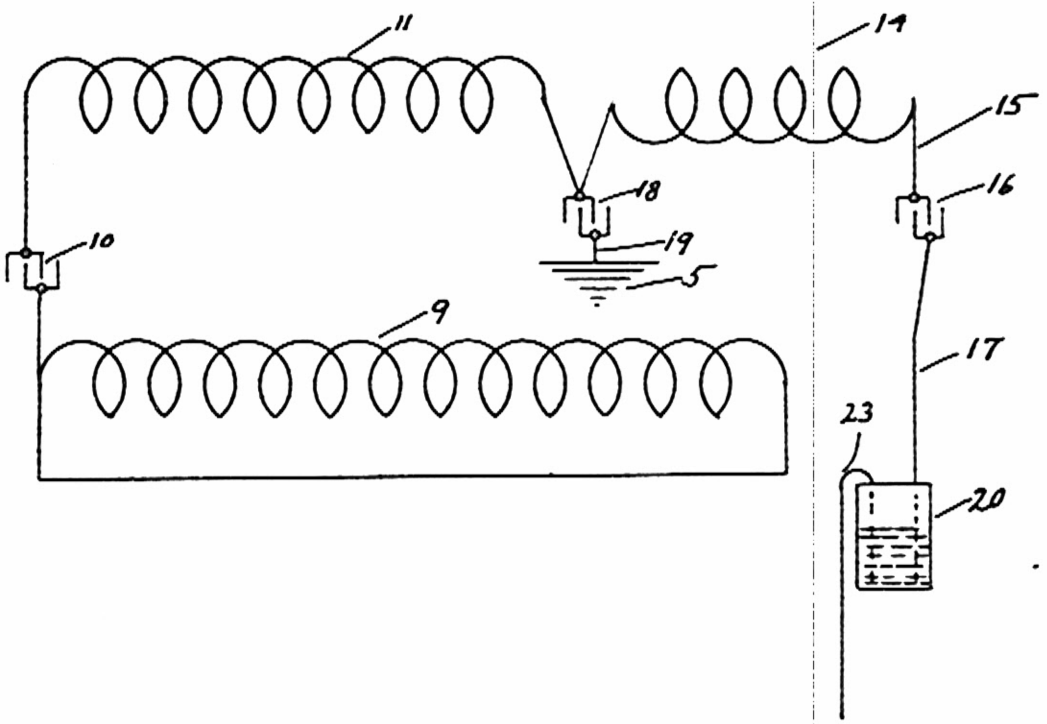
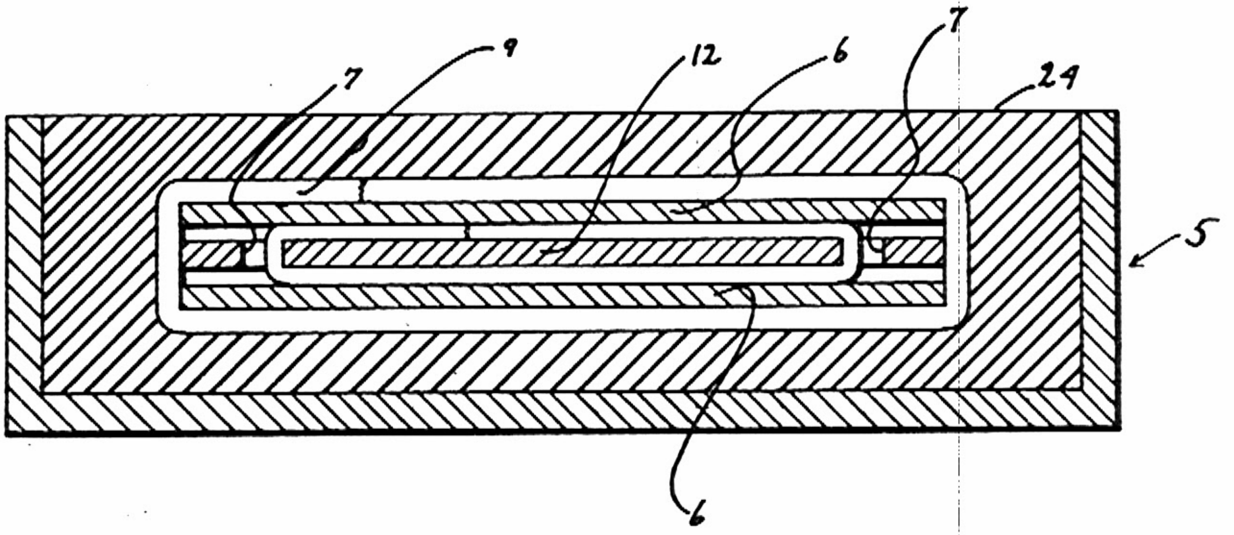


Fig 3



Inventor

James A. Clark

By Clarence A. O'Brien

Attorney

BEST COPY AVAILABLE

UNITED STATES PATENT OFFICE

JAMES A. CLARK, OF EL PASO, TEXAS

RADIOANTENNA DEVICE

Application filed November 28, 1930. Serial No. 498,809.

My invention relates to radio antenna. My invention relates particularly to antenna incorporating means for clarifying and increasing the efficiency of radio reception particularly in the summer time, through eliminating the undesired effects of static and interference arising from neighboring power lines, generators, motors and other electrical machines.

The features of novelty and the various advantages resident in the invention, its nature, and its composition and arrangement and combination of parts will be readily apparent to any one acquainted with the art to which this invention relates upon consulting the following descriptions of the drawings, in which:—

Figure 1 is a front elevational view of my device which is composed of a metallic box or receptacle generally designated 5 which may be of zinc, copper, brass or the like metal.

Figure 2 is a horizontal section through Figure 1 on the line 2—2.

Figure 3 is a vertical transverse sectional view on the line 3—3 of Figure 1.

Figures 4 and 5 are details of the "filter" device.

Figure 6 is a wiring diagram showing the electrical connections of my invention.

The numeral 6 designates an insulated frame formed with longitudinal slots 7 near the longitudinal edges thereof, and slit as at 8 for facilitating the winding of the wires for forming the various coils. The numeral 9 denotes a winding of one hundred feet of No. 14 flexible stranded copper wire each end of which is electrically connected by soldering to a terminal of a .0005 microfarad fixed condenser. The remaining side of one of the condensers 10, is connected to one end of a coil 11 wrapped upon a portion of the length of the part 12 of the insulator through the slots 7, and composed of seventy-five feet of No. 2 solid insulated copper wire wound in a clockwise direction and having its inner end brought out and twisted into a loop 13. The other side of the loop 13 is wound counter-clockwise upon the remaining portion of the part 12 of the insulator into a coil 14 of twenty-five feet of said No. 2 insulated wire. The outer end of the coil 14 designated 15 is connected to one terminal of a fixed condenser of .006 microfarad capacity, the other terminal of which is connected to a wire 17 brought thru the casing 5. The loop 13 has connected thereto one terminal of a condenser 18 of the fixed type of the capacity of .00035 microfarad, the other terminal of which is grounded to the casing at 19.

What is called the "filter" consists of a glass or vitreous jar 20 of approximately a minimum capacity of one gallon. This jar is filled approximately two-thirds full with a solution of salt and water, and it has a cover 21 in which is formed a pair of holes 22 one of which receives the wire 17, and the other the wire 23, leading to the radio set. As observed in the drawings the wires 17 and 23 are led into the jar or receptacle 20 to a point near the bottom thereof.

When the coils have been properly wound and deposited into the casing 5, the casing is filled completely with sealing matter such as wax, paraffine or an equivalent to thoroughly insulate and position the coils therein. It is contended that the best results are obtainable when the metal case is placed in a refrigerator such as a mechanical or other type of automatic refrigerator. In the absence of a refrigerator of this type it may be placed in ice, or in a cool place, or buried in the ground. The device of my invention may be used with or without an outside aerial. In the drawings the sealing material is designated 24.

The connections of the various coils and condensers is very clearly illustrated in the diagrammatic view of Figure 7.

Experiment has disclosed that the use of the device of my invention in connection with a radio receiving apparatus greatly enhances the quality of its reception, and increases the range and clarity of reception and eliminates the annoying static and interference caused by the natural weather conditions and the near presence of artificial electrical disturbance to render the device of my invention operative.

It is to be definitely understood that I do not desire to limit the application of this invention to the particular modification set out herein to illustrate the principles thereof, and any change or changes may be made in material and structure consistent with the spirit and scope of the invention.

It should be stated that the device when employed with an outside aerial is to be connected between the lead-in wire and the radio set. The "filter" is not considered absolutely essential.

What is claimed is:—

A radio antenna device of the class described comprising a metallic casing, coil forms of dielectric material disposed one inside of the other and sealed in said casing, coils on the forms, the outside of said coils having a single loop winding, a condenser having one terminal connected to both ends of the outside coil, and an inside coil consisting of a single winding turned for three quarters of its length in one direction and then reversed for the remaining quarter of its length, a tap lead taken from the turn of wire separating the reversed windings, and a condenser connected to said tap lead and having its other terminal grounded to the casing, one end of said inside coil being connected to the free terminal of the first mentioned condenser, and the other end connected to another condenser carrying at its free terminal a wire led through the casing, a filter connected between said lead wire and the antenna lead wire of a radio receiving set.

In testimony whereof I affix my signature.

JAMES A. CLARK.

May 5, 1936. W. C. GRAVES, JR 2,039,988

RADIO ANTENNA UNIT

Filed Sept. 30, 1935 2 Sheets-Sheet 1

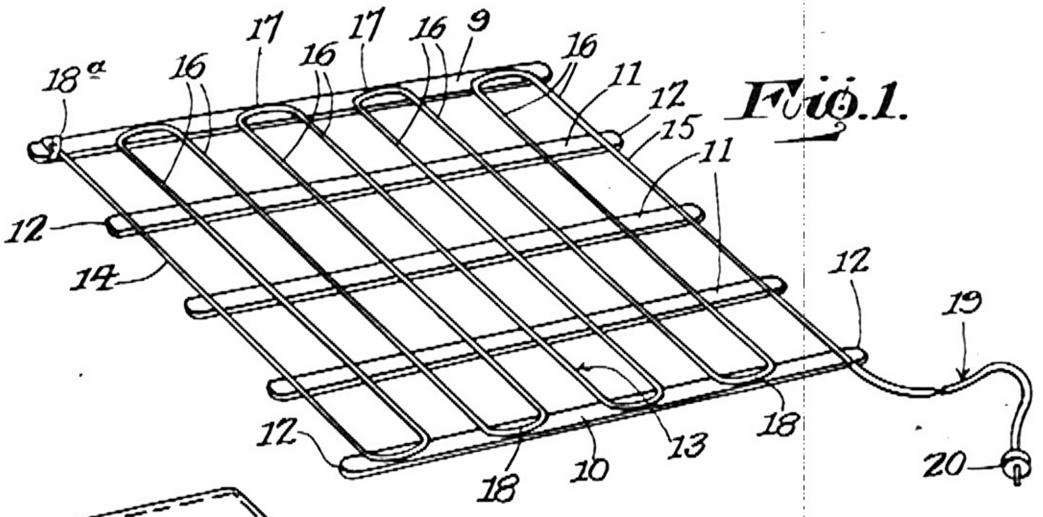


Fig. 1.

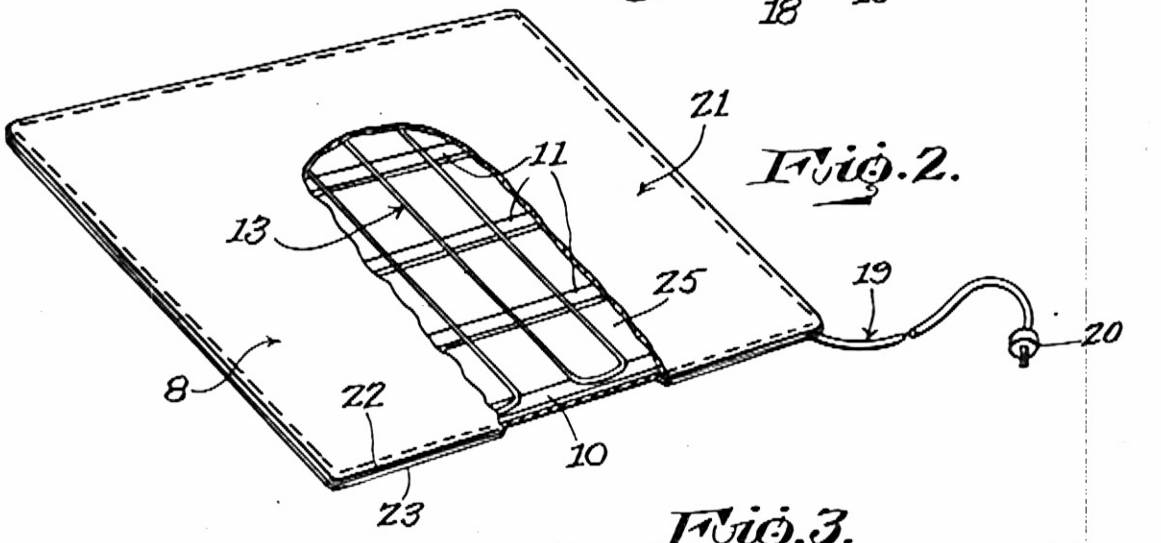
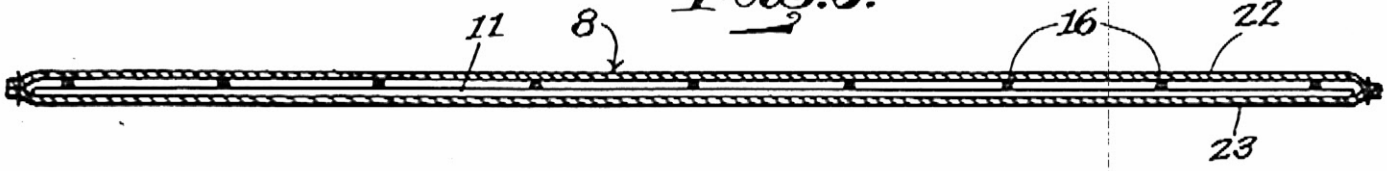


Fig. 2.

Fig. 3.



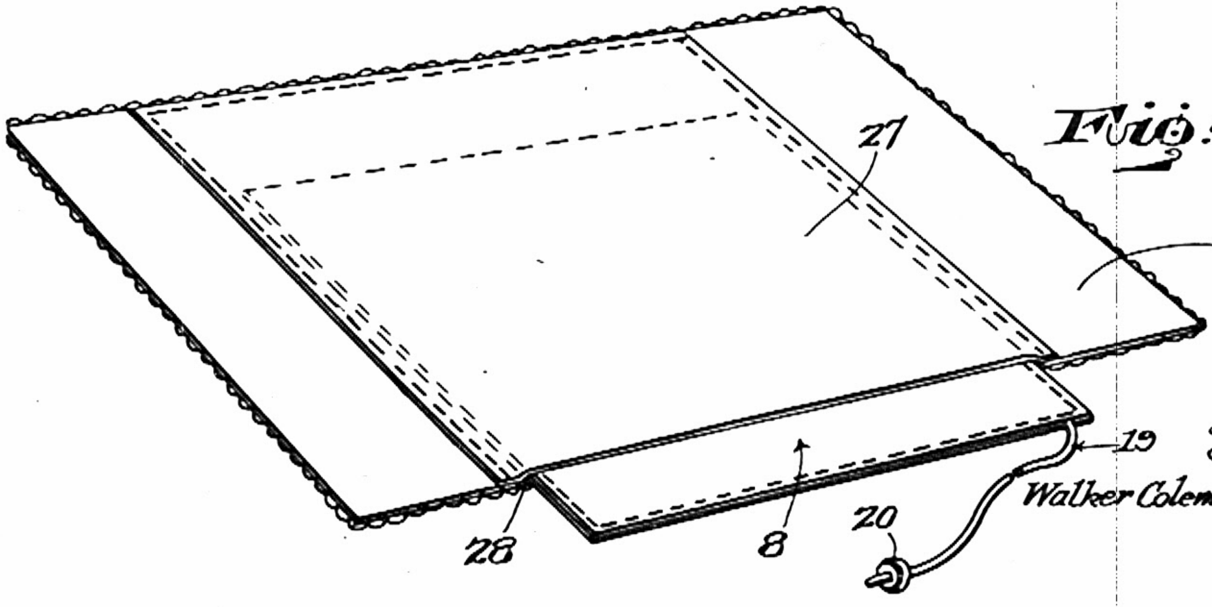


Fig. 4.

Inventor

Walker Coleman Graves, Jr.

By Geo. P. Kimmel

Attorney

May 5, 1936. W. C. GRAVES, JR 2,039,988

RADIO ANTENNA UNIT

Filed Sept. 30, 1935 2 Sheets-Sheet 2

Fig. 5.

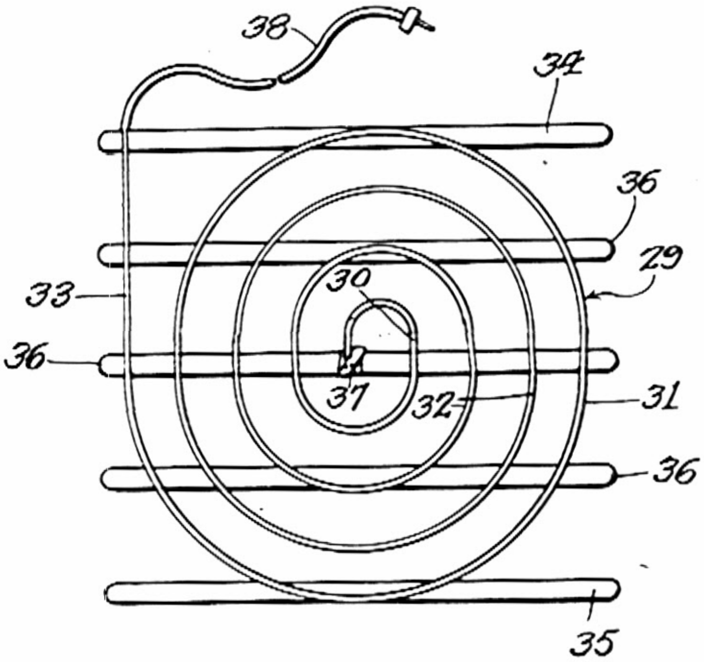


Fig. 6.

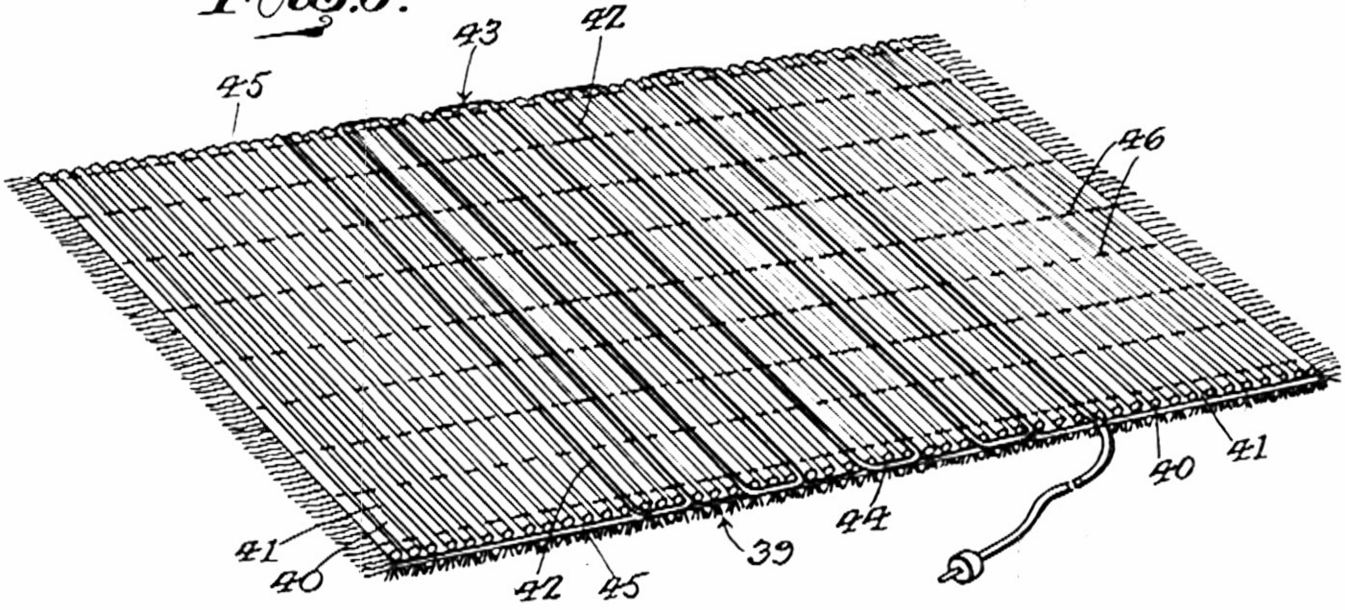
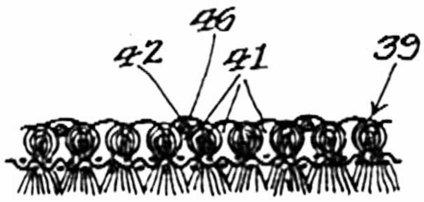


Fig. 7.



Inventor

Walker Coleman Graves, Jr.

By Geo. P. Kimmel

Attorney

UNITED STATES PATENT OFFICE

2,039,988

RADIO ANTENNA UNIT

Walker Coleman Graves, Jr., San
Francisco, Calif.

Application September 30, 1935, Serial No. 42,912

3 Claims. (Cl. 250—33)

This invention relates to a radio antenna unit, and has for its object to provide, in a manner as hereinafter set forth, a portable unit of such class having its appearance appealing to the æsthetic sense and capable of being conveniently arranged at any desirable point within and for eliminating the use of unsightly wires strung around a room.

A further object of the invention is to provide, in a manner as hereinafter set forth, a portable radio antenna unit having its receiver element concealed and with the unit of a form capable of being disposed flatwise upon the floor of a room; supported upon an article of furniture and connected to a table covering.

Further objects of the invention are to provide, in a manner as hereinafter set forth, a radio antenna unit which is simple in its construction and arrangement, strong, durable, compact, in the form of a drugget, conveniently transported to the position desired, attractive in appearance, readily installed with respect to the antenna post of a radio receiving set, thoroughly efficient in the use intended thereby and inexpensive to manufacture.

With the foregoing and other objects which may hereinafter appear, the invention consists of the novel construction, combination and arrangement of parts as will be more specifically referred to and as are illustrated in the accompanying drawings wherein are shown embodiments of the invention, but it is to be understood that changes, variations and modifications may be resorted to which fall within the scope of the invention as claimed.

In the drawings:

Figure 1 is a fragmentary view in perspective of the unit,

Figure 2 is a perspective view of the unit broken away at its front face,

Figure 3 is a longitudinal view of the unit,

Figure 4 is a perspective view of the unit partly extended into a covering for an article of furniture,

Figure 5 is a fragmentary view in elevation of a modified form of receiver forming an element of the unit,

Figure 6 is a perspective view of a modified form of antenna unit inverted, and

Figure 7 is a sectional detail of the structure shown in Figure 6.

With reference to Figures 1, 2 and 3, the unit generally indicated at 8 includes a set of spaced parallel narrow, thin supports of like and the desired length. The outer end supports of said set are indicated at 9, 10 and the intermediate supports at 11. Each support will have its ends 12 rounded. The supports are arranged in equidistant spaced relation and are formed of any suitable electrical non-conducting material. Arranged against corresponding faces of the supports is a receiver element generally indicated at 13 and which is formed from a length of any suitable wire. The latter may or may not be insulated and is shown as being non-insulated from end to end thereof. The element 13 consists of a series of equidistant spaced straight parallel stretches and two sets of spaced curved bends connecting the stretches together and disposed at right angles to the ends of the stretches. The outer stretches of the element 13 are indicated at 14, 15. The intermediate stretches of the element 13 are designated 16. The bends of one set and the bends of the other set of element 13 are designated 17, 18 respectively. The stretches 14, 15 and 16 extend from the support 9 to the support 10 and are disposed transversely of the supports 11. The bends 17 are arranged on support 9. The bends 18 are arranged on the support 10. The free end of stretch 14 is secured to an end of support 9 by an adhesive tape 18^a. The stretches and bends of element 13 are secured by any suitable means to the supports and these latter, when secured to the stretches and bends, act as a bracing means for element 13, a means for maintaining the stretches in spaced relation and a means for retaining the bends of each set in spaced relation. The stretch 15 has that end thereof which is not connected to a bend disposed at the outer side edge of support 10.

The unit 8 includes a lead element 19 for connection to the antenna post, not shown, of a radio receiving set. The element 19 forms a continuation of the wire which provides the element 13. The element 19 extends from the stretch 15, is insulated throughout, carries a plug 20 and is of the length desired.

The unit 8 includes an enclosing cover element 21 for concealing the supports and element 13. The element 21 is formed of two sections 22, 23, preferably of electrical non-conducting material. The sections 22, 23 are secured together in superimposed relation, at the marginal portions thereof, by rows of stitching 24 and which provides a closed pocket 25 in which are arranged the supports and element 13. The element 19 extends from element 21 between the sections of the latter. The bodies of the sections 22, 23 may be of any suitable design for the purpose of making the unit 8 attractive in appearance.

With reference to Figure 4 there is shown a

BEST COPY AVAILABLE

cover **26** for an article of furniture. The cover **26** has secured to one face thereof a web of fabric **27** to provide, in connection with the body of the cover **26**, a pocket **28** for receiving the unit **8** whereby the latter may be disposed upon an article of furniture.

With reference to Figure 5, there is illustrated a modified form of receiver element **29** for the antenna unit. The element **29** is formed from a length of any suitable wire. The latter may or may not be insulated and is shown as being non-insulated throughout. The element **29** is formed of a series of coils and with the coils progressively increasing in length from the inner to the outer coil. The inner and outer end coils of element **29** are indicated at **30**, **31** respectively and the intermediate coils at **32**. The coils are arranged in equidistant spaced relation. The element **29** also includes a straight stretch **33** which merges at its inner end into the outer end of the outer coil **31**. There is associated with the element **29** a set of spaced parallel narrow thin supports of like and the desired length. The outer end supports of said set are indicated at **34**, **35** and the intermediate supports at **36**. Each support will have its ends rounded. The supports are arranged in equidistant spaced relation and formed of any suitable electrical non-conducting material. The coils **30**, **31**, **32** and stretch **33** of the element **29** extend across corresponding faces of the supports **34**, **35** and **36**. The coils **30**, **31**, **32** and stretch **33** are secured by any suitable means against the said corresponding faces of the supports. The inner end of the inner coil **30** of the body part of element **29** is anchored to the central support of the intermediate supports **36** by an adhesive tape **37**. The outer end of the stretch **33** of the element **29** is flush with the outer side edge of the support **34**. The outer coil **31** of element **29** extends upon the outer end supports **34**, **35** and the intermediate supports **36**. Extending from the outer end of the stretch **33** is a lead element **38** constructed in the same manner and for a like purpose as the element **19**. The element **29** and supports **34**, **35** and **36** are adapted to be housed and secured in the cover element **26**.

With reference to Figures 6 and 7, a modified construction of antenna unit is illustrated and which consists of a rug **39** of the form which has its bottom face provided transversely thereof with spaced parallel ribs **40** forming spaced parallel channels **41**. Seated in certain of the channels **41** which are spaced from each other by a plurality of the other of said channels are the stretches **42** of a receiver element **43** of the form shown in Figure 1. The stretches **42** correspond in length to that of channels **41**. The bends **44** of the elements **43** are arranged at the side edges **45** of the body of the rug **39**. The stretches **42** are secured in the channels **41** by the stitchings **46** which form parts of the body of the rug. Extended from elements **43** is a lead element **47** of a construction similar to and for the same purpose as the element **19**.

What I claim is:

1. In a portable antenna unit a series of spaced parallel, thin, narrow, flat supports disposed in lengthwise edge relation, a receiver element formed of a series of spaced pairs of parallel stretches and curved bends arranged in staggered relation and alternately disposed with respect to the said pairs of stretches, each bend coupling a pair of stretches together, said bends and the ends of said stretches being positioned upon one face of and secured to the outer supports of said series, said stretches being disposed transversely upon the inner supports of said series, a lead element for an antenna post forming a continuation of one of said stretches, a close cover element of non-conducting material completely concealing said receiver element and said supports and having said lead element extended therefrom, means for anchoring one of the ends of said receiver element to one end of an outer support of said series of supports, and said lead element forming a continuation of said receiver element at the other end of the latter.

2. In a portable antenna unit a series of spaced, parallel, thin, narrow, flat supports substantially of oblong contour in plan and arranged in lengthwise edge relation, a non-insulated receiver element formed of a series of parallel spaced pairs of parallel stretches and curved bends arranged in staggered relation and alternately disposed with respect to said pairs of stretches, said bends and the ends of said stretches being mounted on and secured to one face of the outer supports of said series, said stretches being disposed transversely of and secured to that face of the intermediate supports which corresponds to the faces of the said outer supports, an insulated lead element for an antenna extending from one end of said receiver element, means for anchoring the other end of said receiver element to one end of one of said outer supports, and a cover element of non-conducting material completely concealing said receiver element and having said lead element extended outwardly therefrom.

3. In a portable antenna unit a series of spaced parallel flat supporting members disposed in lengthwise edge relation, a conductor element formed of a single length of material bent upon itself to form folds and parallel stretches, and means for securing said element upon said supporting members, said parallel stretches arranged transversely of said supporting members and acting to maintain the supporting members in spaced relation, said parallel stretches acting also to brace the supporting elements, a flexible casing for said conductor element and supporting members for enclosing and concealing them, a lead end of said conductor projecting from said casing and said whole structure providing a flexible and readily adjustable concealed antenna unit.

WALKER COLEMAN GRAVES, Jr.

United States Court of Appeals
for the District of Columbia

FILED JUL 12 1945

Joseph W. Stewart
CLERK

BRIEF FOR APPELLEE

United States Court of Appeals

DISTRICT OF COLUMBIA

APPEAL NO. 8982

BENJAMIN WAITE BLANCHARD, JR., APPELLANT

v.

Casper W. Ooms

~~CONWAY P. COE~~, COMMISSIONER OF PATENTS, APPELLEE

APPEAL FROM THE JUDGMENT OF THE DISTRICT COURT OF THE UNITED STATES FOR THE DISTRICT OF COLUMBIA

W. W. COCHRAN,
Solicitor, United States Patent Office,
Attorney for Appellee.

E. L. REYNOLDS,
Of Counsel.

INDEX

Page
Introduction ... 1
Appellant's application ... 2
The prior art ... 2
Summary of argument ... 3
Argument ... 3
Conclusion ... 7
Authorities Cited:
American Steel & Wire Co. of N. J. v. *Coe*, 70 App. D. C. 138, 105 F. (2d) 17 ... 4
Dyer v. *Coe*, 75 App. D. C. 125, 125 F. (2d) 192 ... 7
Fessenden v. *Coe*, 69 App. D. C. 193, 99 F. (2d) 426 ... 7
Kaliska v. *Coe*, 147 F. (2d) 577 ... 7
Messler v. *U. S. Rubber Co.*, 148 F. (2d) 734 ... 5
Minnesota Mining & Mfg. Co. v. *Coe*, 75 App. D. C. 131, 125 F. (2d) 198 ... 7
Sharp v. *Coe*, 75 App. D. C. 118, 125 F. (2d) 185 ... 7

654025—45

United States Court of Appeals

DISTRICT OF COLUMBIA

APPEAL NO. 8982

BENJAMIN WAITE BLANCHARD, JR., APPELLANT

v.

CONWAY P. COE, COMMISSIONER OF PATENTS, APPELLEE

APPEAL FROM THE JUDGMENT OF THE DISTRICT COURT OF THE UNITED STATES FOR THE DISTRICT OF COLUMBIA

BRIEF FOR THE COMMISSIONER OF PATENTS

INTRODUCTION

This is an appeal from the judgment of the District Court of the United States for the District of Columbia (10)[1] dismissing the complaint in an action under R. S. 4915 (U. S. C., title 34, sec. 63) in which the appellant sought to have the Court authorize the issuance of a patent containing claims 2 to 7, inclusive, of his application No. 266,453 for a patent on a radio antenna. The refusal of the claims was based on lack of invention over prior art.

---

[1] The numbers in parentheses refer to pages of the appendix.

APPELLANT'S APPLICATION

The application here involved (37) discloses an antenna comprising three flat windings arranged one within the other and mounted on a wooden framework, the windings being connected together at one end by metal rods arranged in the form of a grid. A metal screen is located on each of the flat sides of the windings and these screens are connected to each other and to the connected ends of the windings.

THE PRIOR ART

The patent to Arias No. 1,820,643 (75) discloses a radio antenna comprising a metal screen supported on a frame and forming in effect an elongated box open at the ends and having a square cross section.

The patent to Speaker No. 1,828,910 (76) discloses a radio antenna comprising a winding of insulated wire wound on a metal cylinder.

The patent to Jones No. 1,840,780 (77) discloses a radio antenna which includes inner, outer, and intermediate winding sections or layers arranged one within the other so that the outer layers electrostatically envelop the inner ones.

The patent to Bodoh No. 1,850,914 (78) discloses a radio antenna comprising a wire winding having inner and outer layers, which winding is supported between inner and outer metal cylinders.

The patent to Graves No. 2,039,978 (79) discloses a radio antenna comprising two flat wire windings arranged one within the other.

The patent to Graves No. 2,039,988 (80) discloses an antenna formed by a wire sinuously arranged in a single plane and supported between sheets of insulating material.

SUMMARY OF ARGUMENT

1. The structure of the appellant's application involves no radical departure from those of prior patents.

2. It has not been shown that appellant's device produces results materially better than those of the prior art.

ARGUMENT

It is true, as the appellant argues, that the antenna shown and claimed by him is not shown by any single prior art patent. On the other hand, this antenna involves no feature which is basically new, being made up of a metal grid, wire windings located one within another, and flat pieces of metal screen. Each of these elements, alone, is old in the radio antenna art. Thus, grids are shown by Graves, wire windings located one within the other by Clark, Bodhoh, and Jones, and flat surfaces of metal screen by Arias. The appellant has merely assembled these old elements in a single device, placing them one within another. Since it is old to place the coils one within another, it would be obvious to extend this arrangement to include the grid and screen, if they were to be incorporated with coils in a common structure.

It is apparent that the conventional radio antenna elements of the prior art may be assembled and arranged in an almost endless variety of ways, and it is equally apparent that a patent should not be issued whenever such an assembly is made. The grant of a patent on such an apparently arbitrary assembly of old elements as is claimed here could be justified only on the ground that the results produced are markedly and unexpectedly superior to those attained by the use of the elements alone.

The appellant's case, therefore depends on his ability to make a convincing showing that his assembly of coils, grid, and screens produces much better results than do coils, grid, or screen when used separately. In other words, it should be shown that appellant's structure is superior to that of any of the patents of record, or, at least, to representative ones of them. The District Court, in its tenth finding of fact (9) held that such a showing has not been made, and it is submitted that this holding is clearly correct.

The appellant relies, to a considerable extent, upon statements contained in affidavits which were submitted during the prosecution of his application before the Patent Office. While the filing of such affidavits is provided for by the Rules of Practice of the Patent Office, it is submitted that they can be given no weight here. The Patent Office, having no provision or facilities for the taking of testimony in ex parte cases, has seen fit to accept affidavits in certain cases, but the proceeding in the District Court is a trial de novo, and the ordinary rules of evidence apply (*American Steel & Wire Co. of N. J.* v. *Coe,* 70 App. D. C. 138, 105 F. (2d) 17, and authorities there cited). In the present case the affiants did not, in court, reaffirm the statements made in their affidavits, and they were not produced for cross-examination. The affidavits, therefore, clearly would not have been proper evidence if they had first been produced in court, and the fact that they had previously been offered to the Patent Office does not make them competent. The decision of the Court of Appeals of the Second Circuit in the recent case of *Messler* v. *U. S. Rubber Co.*, 148 F. (2d) 734 appears to be in point here. In that case it was held that an affidavit filed in accordance with the Rules of the Patent Office during the prosecution of an application could be given no weight in a suit on the patent granted on such application.

For the reasons given, it is submitted that the affidavits should not be considered. In the event that they are considered, however, they will be found to be insufficient for reasons similar to those which will now be pointed out in connection with the testimony.

The testimony consists principally in general laudatory statements as to the good results obtained by using appellant's antenna. Such general statements are not material here, since the utility of the device has not been questioned. The issue is not whether it is useful, but whether it is superior to the similar antennae shown by the cited patents. This is a matter which can be determined only by direct comparison; and no such comparisons have been made. The record contains some general statements as to the superiority of appellant's structure over certain commercial antennae, but such statements are also immaterial here since the claims have not been rejected on such commercial devices, but on the patents of record. So far as the patented structures are concerned the record contains nothing more than speculation by the inventor himself, to the effect that they are inferior to this antenna. Obviously, such self-serving guesses cannot take the place of actual evidence. The inventor admitted (X Q. 93, appendix, page 26) that he had not actually tried the antenna of any of the patents cited.

It is argued in the appellant's brief that it would be difficult for him to make the tests necessary to show that his device is superior to those of the patents. It seems evident, however, that it cannot be assumed merely because it may be difficult to make tests, that such tests, if made, would give results supporting the appellant's contentions. Moreover, the devices of the patents are comparatively simple and it is not thought that any prohibitive expense would have been involved in making and testing them. The appellant has not seen fit to do this, but has confined himself to speculation and comparison with commercial devices of his own selection. This is not thought to be sufficient to overcome the rejection.

The appellant also argues that the Patent Office has allowed the six patents here of record "and many more, on radio antennae that are mere modifications of the old loop antenna then in common use, without insisting upon such laboratory tests as required in this case" (Brief page 17). There is nothing in the record to support this assertion. Moreover, the procedure followed in other cases is not in issue here. If the Patent Office has improperly allowed other patents, this does not justify an improper allowance of claims in the present case (*Minnesota Mining & Mfg. Co.* v. *Coe,* 75 App. D. C. 131, 125 F. (2d) 198; *Dyer* v. *Coe,* 75 App. D. C. 125, 125 F. (2d) 192; *Sharp* v. *Coe,* 75 App. D. C. 118, 125 F. (2d) 185; *Fessenden* v. *Coe,* 69 App. D. C. 193, 99 F. (2d) 426; *Kaliska* v. *Coe,* 147 F. (2d) 577).

CONCLUSION

It is submitted that the appellant's structure involves nothing more than the assembly, in an obvious manner, of antenna elements which are old per se and which, when assembled, do not, so far as the record shows, produce any better results than they did when used separately. The finding of the District Court that no invention is involved therefore finds ample basis in the record, and the decision appealed from should be affirmed.

Respectfully submitted.

W. W. Cochran,
Solicitor, United States Patent Office,
Attorney for Appellee.

E. L. Reynolds,
Of Counsel.

U. S. GOVERNMENT PRINTING OFFICE: 1945